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Speaking of Spain

With 37 Illustrations and Map
27 in Natural Colors

LUIS MARDEN

Arizona Sheep Trek

With 23 Illustrations and Map
16 in Natural Colors

FRANCIS R. LINE

Kew: The Commoners' Royal Garden

With 31 Illustrations
22 in Natural Colors

THOMAS GARNER JAMES
B. ANTHONY STEWART

Voices of the Night

With 27 Illustrations
23 in Natural Colors

ARTHUR A. ALLEN

Feast Day in Kapingamarangi

With 14 Illustrations and Map
6 in Natural Colors

W. ROBERT MOORE

Okinawa, Pacific Outpost

20 Illustrations

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Speaking of Spain

By LUIS MARDEN

With Illustrations from Photographs by the Author

ALL SPANIARDS," the saying goes, "have in them a little of Quixote, something of the poet, and a good deal of the bullfighter."

But first and last, the Spaniard is an individualist. The philosopher Miguel de Unamuno wrote of his countrymen: "It is difficult to govern a nation of 22 million kings"—and now there are 28 million of them.

Through more than a decade of travel through the countries of Spanish America for the NATIONAL GEOGRAPHIC MAGAZINE, I came to know the offspring pretty intimately, but always I was curious about the mother country. When finally I went there, I was impressed by Spain's people even more than by the rugged beauty of the mountainous peninsula.

My introduction to the country was typical. I had driven from Paris through southern France to the international bridge at Hendaye. French officials told me that the day was a Spanish holiday, but they let me walk across the bridge into Irún.

On the Spanish side, a Civil Guard in a shiny patent-leather three-cornered hat and yellow Sam Browne belt took me to the customs inspector, who told me he had no permits for me to enter with my photographic equipment and car of French registry. The representative of the Spanish State Tourist Department, who had my papers, was in San Sebastián with his family.

I said I would wait in France until the next day, but the customs inspector would not hear of it.

"If you don't mind," he said, "wait a little longer. If Don Cecilio does not return with

the papers, come over with your car anyway. I think you would like to stay in San Sebastián, which is only 11 miles away; you will be more comfortable there. We will permit you to drive to San Sebastián to spend the night, if you promise to return in the morning to go through customs."

The assumption that everyone will respect a gentleman's agreement, and that a man's word is inviolable, is typically Spanish.

Shortly after our talk, Don Cecilio arrived at the bridge. Everything was put through in a few minutes; then all of us—Don Cecilio, the customs inspector, a captain of the Civil Guard, and I—went to a small bar near the international bridge and with wine of Jerez drank a toast to my first night in Spain.

That night Don Cecilio drove with me to San Sebastián. This fashionable watering place faces a horseshoe-shaped bay, the Concha. Here the late King of Spain had a lavish summer palace, and people of fashion come in season to be seen and to bask in the sun.

Spain Averages 2,000 Feet Above Sea

Late one evening I started on the 300-mile drive over the mountains to Madrid.

Spain has nearly every kind of topography and climate—snow-capped mountains, bare hills, fertile green farmlands, austere steppes, and subtropical southern coast plains. But the feeling of height and the cold, sharp air of altitude predominate.

After Switzerland, Spain's tumbled terrain averages highest above sea level in Europe. The land has an average height of 2,000 feet, and nearly everywhere it rises directly from



Every Spaniard Loves Sea Food—and a Man with a Camera

Madrid's big central fish market near the Toledo Gate receives and distributes tons of sea products each morning. These turbot, highly esteemed on the table, often reach a weight of 30 to 40 pounds. Their smaller relative, the sole, is one of the world's finest food fishes. In America, where the edible salt does not occur, "sole" on a menu usually means another flatfish, the flounder.

the sea, rather than from a lofty central plateau, as in Switzerland.

The highroad of France that runs from the frontier to Madrid passes through the old cathedral city of Burgos. The night I was there a half-moon made the fretted stone bulk, its boss-studded spires flecked with black patches in the white light, loom more like a fortress than a church.

According to academicians, people of Burgos and Valladolid speak the purest Castilian. I found it necessary to reorient my Spanish in Spain. For example, the second person plural of verbs—the *vosotros* form—has disappeared from the common speech of Spanish America. I had to learn it all over again, and for some time felt self-conscious in the use of it. In Spanish-speaking America it is used only in

sermons, Presidential proclamations and speeches, and the like.

Beyond Burgos the road ran among rolling hills, through villages of barred and shuttered stone houses. When I heard music and saw figures moving on a playing field in one village, I stopped to look. Villagers were dancing in pairs to the music of a clarinet, trumpet, and accordion.

When I asked one of the men what the occasion was, he looked at me in astonishment. As if one needed some special reason to dance!

Madrid Nearly in Exact Center

Madrid lies almost at the exact geographic center of the country. It stands at the northern end of the somber plateau of New Castile. The surrounding wind-swept and treeless plain,



Bulky Cork Bark Is Light Because More than Half of It Is Air

Sevilla workmen bale the spongy outer bark of the cork oak, *Quercus suber*. Such oaks grow wild throughout Spain, and are stripped every nine to ten years during the summer months. Processors boil and scrape cork, then divide it into three to five grades, according to thickness and quality. Best grades make, among other things, bottle stoppers and fishing-rod handles.

and an altitude of 2,150 feet, highest of all European capitals, give this city of nearly a million and a half a harsh climate. Winters are cold and summers burning hot.

I drove into Madrid in the dark hours of early morning, too tired to notice much of the sleeping city; but when I left my hotel later that day, I found myself in the center of a handsome "monumental city," with many public monuments and fountains, broad avenues, and elegantly ornate architecture. Even banks and insurance company buildings are topped by symbolic statuary and heroic-size quadrigae in the grand manner.

Under arching jets of water at the center of a circular plaza the goddess Cybele sits in a chariot drawn by lions (page 444). Close by, with its embrasured façade facing the Paseo

del Prado boulevard, stands the Prado Museum.

As I wandered through the galleries, my head swam with the fabulous profusion of Velázquezes, El Grecos, Goyas, Murillos, Tintors. Pictures that I had seen reproduced only in art books and in prints were here in their original beauty.

From the Cybele fountain the Calle de Alcalá, Madrid's principal street, runs straight to the square of the Puerta del Sol (page 450). Just beyond the Cybele, the Gran Vía, main shopping and theater thoroughfare, branches off from Alcalá, runs uphill to the Plaza del Callao, then tilts downward again; so that from this end on a clear day one can see in the distance the mountains of the Sierra de Guadarrama.



Drawn by Theodore P. Thompson and Fritz H. Aldinger

Like a Stretched Bull's Hide Is the Outline of Mountainous Spain, Second Highest Country of Europe

Spain's average of 2,000 feet above sea level is exceeded only by Switzerland. Occupying six-sevenths of the pentagonal Iberian Peninsula, the country has such varied topography that it has been called "Land of the Unexpected." Abundant rains fall in the northern maritime Provinces, but most of Spain has a dry, sunny climate, with extremes of cold and heat, expressed in the old Spanish proverb, "Nine months of winter and three months of hell."

In winter, icy winds from the snow-covered Sierra blow across the open plain to whirl down the length of the Gran Via. But in fine summer weather, swank cafés place tables on the sidewalk. Crowds jam these "terraces" at the apéritif hour before lunch or dinner.*

Cafés Are Streetside Offices, Clubs

Shops and offices close at 1 p.m. in Madrid, to reopen at 4. People begin to drift to the cafés about 1:30, and by 2 o'clock tables are at a premium.

Close to being all things to all men, the cafés combine club, office, forum, theater, and trysting place. Most employ a *Buttóns*, a boy in bellhop uniform who runs errands for

clients. He will buy a newspaper, get shoe-laces, bring writing paper and pen and ink, make a telephone call, or climb five flights of stairs to deliver a message to a phoneless friend.

Habitual customers may sit for hours over one or two cups of coffee; no one, except shoe-shine boys and sellers of lottery tickets and cigarettes, will disturb them.

There are 1,500 taverns and nearly a thousand cafés and bars in Madrid alone. Taverns form the humblest category: they are small, friendly places where customers stand at the

* See "Madrid Out-of-Doors," by Harriet Chalmers Adams, NATIONAL GEOGRAPHIC MAGAZINE, August, 1931.

counter to drink white wine or beer.

More pretentious are the bars, with tables and a more diverse selection of *tapas* (snacks), such as cold cuts, shrimp, clams, oysters, crabs, lobsters, goose barnacles, and fried squid.

Most elegant of the three, the cafés proper often are sumptuously furnished, with crystal chandeliers and period furniture. Some strive for originality; in one, live songbirds fly about and perch on branches behind the bar.

In Spain the *apéritif* means food as well as drink. People sip sherry, manzanilla, or beer while eating appetizers of all kinds.

Spaniards love sea food before meals. To see shellfish in its variety and abundance, one must go to one of the few places in Madrid that serve draught beer. Here the discarded shucks of boiled shrimp rise in ankle-deep pink drifts on the floor. Spaniards eat shrimp the year round and must consume hundreds of thousands of pounds annually.

As an old shellfish fan, I thought I was familiar with most of these sea products, but here I found some new ones. An enormous crab I saw weighed more than five pounds (page 440); the girl who sold them said they sometimes reach double that weight, and I could see why Galicians who catch these call them "oxen of the sea."

With a friend whom I had first met on the ship going from New York to Cherbourg, I went one night to the street called Echegaray. At 9 o'clock, cocktail hour in a country that dines from 10:30 to 11, narrow Echegaray Street is thronged with people. Almost every other door opens into a bar or tavern, many of which decorate their walls with brilliant



Madriileños Must Be Home by 11 or Be Locked Out

At that hour night watchmen rap on Madrid doorjambs, warning householders they are about to lock up. Late-comers clap hands to summon the guard, who carries the apartment key in his leather vest. Some residents have their own passkeys (page 422).

bullfight posters or with regional scenes in colored tile.

Natives of Madrid Called "Cats"

Madriileños (natives of Madrid for some reason are also called *gatos*, "cats") progress slowly down Echegaray, stopping at every—well, nearly every—bar for a small glass of white wine. Most wineshops throw in a snack with the drink. This may be a fried shrimp, a bit of mountain ham, a miniature meat ball, or a hot sausage on a square of bread.

In one tavern we sat on high stools at upended wine casks for tables, watching the stream of customers. A man overheard us talking and said:



Like a City of the King Arthur Legends, Avila's Battlements Loom Through Early-morning Mist

Avila carefully preserves one of the world's finest medieval walled cities (page 432). Stokes return each year to ever-growing untidy trails on its belfries and towers. The city stands on the bleak Castilian plain between two mountain ranges, from which wolves descend to raid sheep flocks grazing outside the walls.



As Regular as Sunday's Noon Mass in Córdoba Is the 1 o'clock Shine Outside Church

Gabardine topcoats are standard in Spain. Many men throw them round the shoulders, cloak fashion, like two of these Córdobaans. Some of these shiny boys wear rope-soled sandals. Inflation has driven up the price of the shine, but it sells for less than five cents.

"What! An American come to write about Spain? Stupendous! Have a drink."

"Stupendous" currently describes everything in Madrid: it has become the favorite adjective of Spain.

White-aproned men behind the bar hustled about with sticks of white chalk thrust over one ear. When they set down the small glasses of white wine, they wrote the amount of pesetas on the counter before each customer. They did this for each round, then totted up the amount to be paid before wiping the bar clean with a damp rag.

Behind the bar stood a small slotted barrel, the *bote*. A client left a few *céntimos* for a tip. Before dropping them into the barrel, the barman cried, "Twenty for the bote!" and all his colleagues shouted in drawn-out unison, "Gra-c-i-a-s!"

Columbus an Ensign in Spain's Navy

Titles of nobility are still common in Spain; one meets counts regularly, marquesses occasionally, and once in a while a duke.

Names connected with the conquest and discovery of America are still alive here. I met the Viscountess of Ilúcan, a black-haired lady named Alicia Moctezuma, who is a direct descendant of the last emperor of Aztec Mexico. She closely resembles portraits of the monarch, even to a mole on the cheek.

The present-day Christopher Columbus, Duke of Veragua and Admiral of Castile, is a young ensign in the Spanish Navy.

"If you meet him, don't say I told you," said a friend; "but when he took his entrance examinations for the Naval Academy, he failed in only one subject—navigation."

Spaniards take their scholastic careers seriously; courses at city schools demand it. One man complained to me that his son had to study calculus at the age of 12.

When I was in Madrid, the streets, like volcanic earth, were in a constant state of unrest. Workmen tore up the cobblestone paving of whole blocks and squares at a time.

There is the story of the foreign visitor who, when asked how he liked the capital, replied, "It should be beautiful—when they finish it."

Most Madriderers live in flats in multistoried apartment houses. On the street level, big double doors of wood or of iron grillwork open into an entryway where the concierge has his rooms.

The old custom of the night watch persists in Madrid. At about 11 every night, the watchman, who usually wears a brass-bound visored cap and carries a truncheon, walks along his block, rapping with his right

stick on doorjambs as he goes. This warns the householders that locking-up time approaches (page 419).

When I walked for the first time on silent Madrid streets after midnight, I was startled to hear a smacking sound. The reports sounded like pistol shots in the still night air.

Rounding the corner, I saw a man impatiently clapping his palms together. Someone called "Coming!" and the night watchman, muffled to the throat against the chill, came running up. From a many-pocketed leather vest he selected one of a dozen big keys and unlocked the door.

Night owls usually tip the watchman who lets them in, even though each tenant contributes a monthly sum toward the man's salary. A few forehanded people carry their own passkeys, unless they live in an old building, in which case the huge iron keys are too bulky.

One must also summon the watchman to be let out of the building. When with a dozen people I left a party late one night, we had to thrust our hands through the grillwork of the locked front door to clap. Nearly a quarter of an hour passed before the watchman, who had taken refuge from the cold in a tavern near by, came out and heard us.

Traditionally, the night watchmen of Madrid come from Galicia. Mostly they are discreet, silent men who, though they see everything, see nothing.

Cloaks Are Coming Back

As the nights grew colder in Madrid, I began to see men wearing the *capa*, the typical cloak of Spain. Mostly older men wear them now, but people told me that more cloaks have appeared in Madrid in the last year or two.

One must know how to "carry the cloak," the Spaniards say, to wear it with grace and elegance. The best ones come from Seseña's shop, in Madrid. Made of fine woolen Béjar cloth, most modern cloaks are short, coming to slightly below the knees. Usually they are midnight blue or black, though occasionally one sees a high-collared "Goya" in brown or maroon.

When laid out flat, the *capa* forms a full circle. It is cut full so that the wearer may throw one edge, lined with velvet or fur, round his neck in cold weather.

Thus enveloped, a man is snugly warm, but as tightly confined as if rolled in a rug. I wonder how Spaniards of an earlier age drew their swords in a hurry.

I wanted to find out something about bulls and bullfighting, so I went to the suburb of



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423

Restorations by Luis Merino

In La Mancha, Where Don Quixote Tilted at "Giants," Huge Mills Still Spin

Cervantes's mad knight imagined the whirling vanes were menacing arms. When he charged, the sails toppled him from his horse; hence the phrase for foolish enterprises, "tilting at windmill."



London Races, Circulations and Round Fair Ave 8 to 9 Sept Fair Is On in Sevilla
The above is a list of the names of the various fairs and races held in the city of Sevilla during the month of September. The names are given in the order in which they are held, and the dates are given in the order in which they are held.

Woman's Gay Millinery Is Man's Old Hat

The latest fashion in millinery is the "old hat" which is a revival of the styles of the 18th and 19th centuries. It is a simple, elegant design with a wide brim and a high crown. The color is usually black or dark brown, and it is often decorated with a ribbon or a bow.

And now, when you see a woman wearing a "old hat," you will know that she is a fashion leader. It is a style that is both classic and modern, and it is one that is sure to be popular for many years to come.

There are many different styles of "old hats," and each one has its own unique charm. Some are simple and elegant, while others are more elaborate and decorative. But no matter what style you choose, you will be sure to look like a true fashion leader.



This Butler Donkey Wears a Precious Ornament

The Butler Donkey, a small, white, and black animal, is a popular pet in the United States. It is a small, sturdy animal that is known for its intelligence and loyalty. The Butler Donkey is a breed of donkey that is native to the United States.

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On the Golden Sands of Seville's Ring, a Bull Prepares to Charge His Enemy

At the Plaza de Toros de Sevilla, the most famous bullfighting arena in the world, a bull prepares to charge his enemy, the matador, on the golden sands of the ring. The scene is captured in a vintage color photograph, showing the large crowd of spectators in the stands and the city of Seville in the background.





1. **Introduction**
 2. **Background**
 3. **Methodology**
 4. **Results**
 5. **Conclusion**
 6. **References**

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes the need for transparency and accountability in financial reporting.

2. The second part of the document outlines the various methods and techniques used to collect and analyze data. It includes a detailed description of the experimental procedures and the statistical analysis performed.

3. The third part of the document presents the results of the study. It includes a series of tables and graphs that illustrate the findings of the research. The data shows a clear trend in the relationship between the variables studied.

4. The fourth part of the document discusses the implications of the findings. It highlights the potential applications of the research in various fields and the need for further investigation.

5. The fifth part of the document concludes the study. It summarizes the key findings and provides a final statement on the significance of the research.



A Gypsy Girl and the Alhambra embody the Beauty and Romance of Spain

FIG. 10. *Illustration of a Gypsy girl in a blue and white dress, holding a bouquet of flowers, standing on a tiled floor in front of a large window with a metal grid, looking out onto a green landscape.*

fuencarral to talk with José Roger, a retired matador with the ring name of "Valencia," who kept a bullfighting school.

In a small bullring on the grounds of Valencia's house, I watched serious-faced young men training for the dangerous profession. One of their number acted as the bull. With a pair of bull's horns held in the hands he charged the capes of his fellow students.

Pepe, the master, explained the difference between the magenta silk cape, which is held in both hands, and the scarlet serge muleta, usually used with only one hand in the final stage of the bullfight.

Pepe showed me how to hold the cape, with the elbows held away from the body and the wrists supple and natural, "dominating" the bull and taking him past the body with the cape, then twisting in the opposite direction to receive the bull's next charge (pages 426, 433).

Bullfighter Turns Fisherman

All this and more Pepe explained, until my friend Julio told him I was a trout fisherman. Then the killer of bulls became a killer of trout.

"Man!" Pepe said excitedly. "Lacking masters, I have had to teach myself to cast the fly. With an old rod and a piece of curd, I practice in this very ring. Tell me, do you fish the dry fly?"

From then on I could learn nothing more about bullfighting. When Pepe showed me his exquisitely embroidered "suits of lights," he said:

"See, here is where I have pulled out the gold and silver threads to make trout flies."

With regard to trout fishing, "Practically all the rivers in Spain north of Madrid contain trout," Pepe told me. "Madrid's water supply comes from the Lozoya, a good trout stream not far from here. The other day workmen opened a water main downtown and took out a fat trout about a foot and a half long."

For some reason, I had always thought of Spain mainly as a warm southern country. Actually, Madrid lies near the latitude of New York, and the northern coast of Spain almost coincides with the Maine-Canada boundary. This helps explain why trout and salmon rivers abound in Spain.

"We allow no netting of salmon or trout in this country," said Max R. Borrell, director of sports for the Spanish State Tourist Department. "On the other hand, we have about 5,000 rod-and-line professional fishermen on our rivers, who make their living by catching trout and salmon for market. Frequently the

professionals catch 40 to 50 trout a day with the fly. We have a closed season, but no bag limits.

"Thousands of salmon are taken each year by sport and professional anglers. On the opening day of the 1949 season, a 35-pound salmon was caught in the Nansa River."

Salmon an Expensive Dish

Salmon in Spain, which are the Atlantic species (*Salmo salar*), identical with salmon of Scotland or Canada, may bring two to three dollars a pound in the Madrid market early in the season. Some anglers who come to Spain defray part of their expenses by selling their catch. Mr. Borrell added that broadbill swordfish and giant bluefin tuna abound in the sea off Tangier and Tarifa.

I asked him about shooting in Spain.

"We have nine species that we list as big game—bear, wolf, ibex, chamois, red deer, fallow deer, roe deer, wild boar, and lynx.

"As to birds, it is not uncommon to shoot a hundred ducks or graylag geese in one day. One of our best shots, the Count of Teba, shot in one 5-month season 4,072 partridges."

In season, partridge, trout, and salmon commonly appear on the menu of Madrid restaurants. I asked how, in the face of these enormous bags, it was possible to maintain such an abundance of game.

"Spain is relatively little industrialized," said Mr. Borrell, "and therefore does not have the widespread river pollution of a heavy manufacturing country. We still have immense tracts of wild and desolate country. And then there are few hunters and fishermen compared with the total population."

In a booklet written by the English wildlife artist W. H. Riddell, I read of the extraordinary flights of waterfowl in the Marismas, the vast expanse of marshland at the mouth of the Guadalquivir River in southern Spain.

Riddell records that he saw a mass of ducks at rest in open water, ten racks deep and nearly three miles long. He estimated that the flock contained thirty to forty thousand widgeon. These, with teal, mallard, and pintail, are the species most commonly seen in Spain.

Through the courtesy of Don Luis A. Bolin, Director General of the Tourist Department, I was invited to visit a fishing and shooting preserve in the Sierra de Gredos, a mountain range near Avila, where lives a rare wild goat, the Spanish ibex (*Capra pyrenaica*).

The state protects the ibex, which live high up in the snows of the Sierra. No hunter may go out without a keeper and trackers, who make sure he shoots only old males.



What a Covered Wagon in Halls: You Have a Mercedes Taxi

We took a Mercedes taxi in the morning, and it was a very comfortable ride. The driver was a very experienced man, and he took us to the hotel in a very short time. The Mercedes taxi was a very comfortable ride, and it was a very short time to the hotel.

The street is very wide, and the houses are very large. The street is very wide, and the houses are very large. The street is very wide, and the houses are very large.

At the end of the street, there is a large building. The building is very large, and it is very old. The building is very large, and it is very old. The building is very large, and it is very old.

We went to the hotel, and we were very comfortable. The hotel was very large, and it was very old. The hotel was very large, and it was very old.

On the roof and battlements, storks perched in ranks, and ever and

when a parent bird glided down on her prey, a lizard or snake, bringing from its red beak.

After feeding the young, the storks tilted their heads back and uttered a loud, hoarse cry, which was repeated many times.

No More Kisses

Under the arched eaves of the hotel, a man was sitting on a bench. He was looking at a row of framed signs on the wall, each with a picture of a fish. He pointed to a sign that said "Shrimp" and then to a sign that said "Crab". He then pointed to a sign that said "Fish" and then to a sign that said "Shellfish".

The man was looking at the signs, and he was very interested. He was looking at the signs, and he was very interested.

"You will understand," he said, "that the fish are very good. The fish are very good, and the fish are very good."

He was looking at the signs, and he was very interested. He was looking at the signs, and he was very interested.

The man was looking at the signs, and he was very interested. He was looking at the signs, and he was very interested. The man was looking at the signs, and he was very interested.

He was looking at the signs, and he was very interested. He was looking at the signs, and he was very interested. He was looking at the signs, and he was very interested.

He was looking at the signs, and he was very interested. He was looking at the signs, and he was very interested. He was looking at the signs, and he was very interested.

tered against the sky
to the North where the
the glow of the rising
sun suffused the snow
fields with red rose-
tinted brightness. I
mounted and through it
crossed the low val-
ley and the power at
last burst forth in a
white light so dazzling
it hurt the eyes (page
451).

After breakfast we
drove down to Larissa
through lovely re-
viving and healthy
country, beginning
at 11:30 AM. Here
the Thermopylae
about 1000 ft above
level of the sea,
rocky cliffs

As the sun came out we found the sheep and we saw many brown trout in the river. We looked as if in green glass. I took five windows not only for a good view but also for a good photograph.

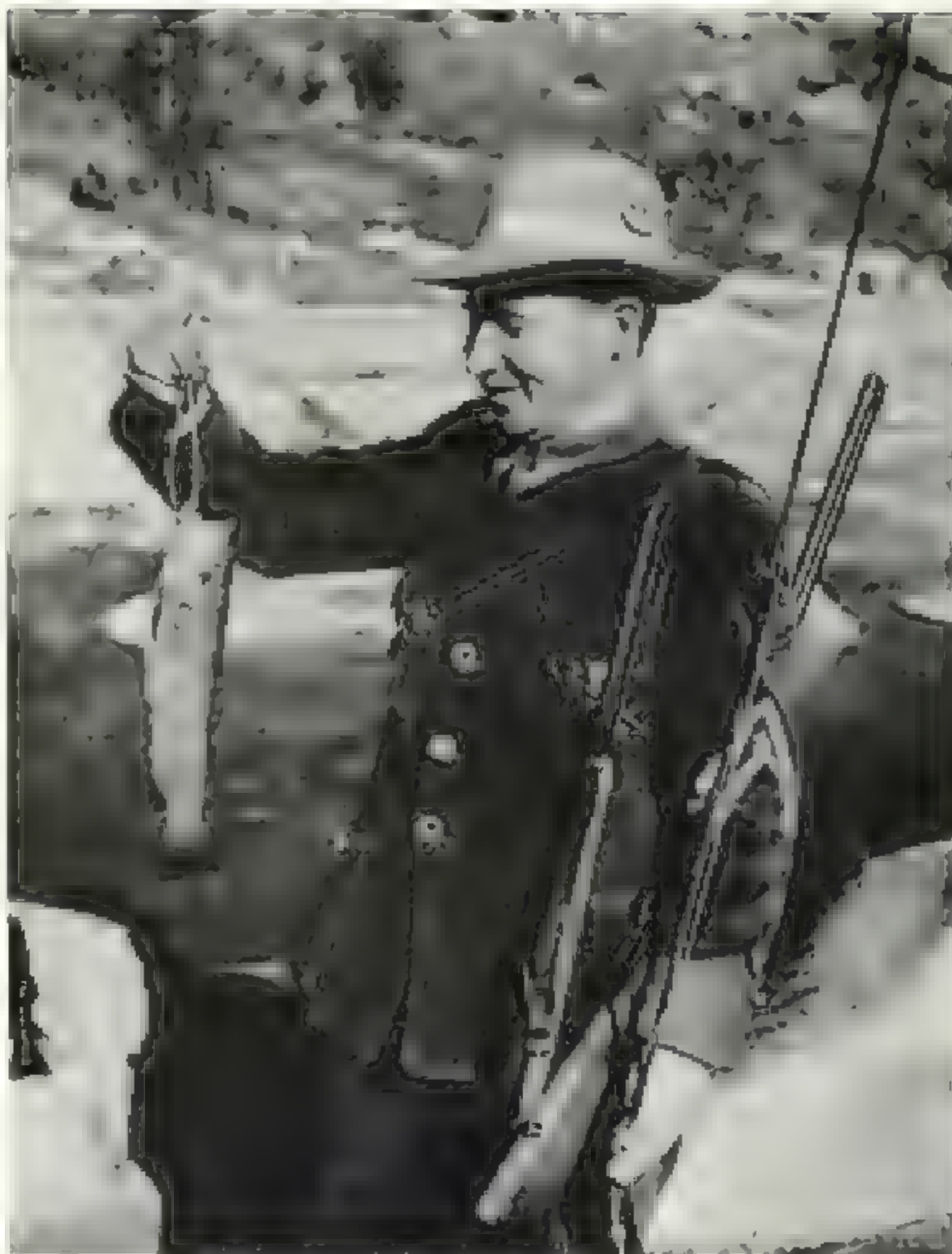
It was early in the season for the first time when we came even to our father's and mother's Spanish and those who were found in it all originated near Leon in the 16th century.

For a single and good

It is always the case that the more the people know about the world, the more they want to know. They want to see a world passport before they get their passport.

[illegible]

I gave him a second warning, then struck sharply at the top of his head with a pencil and he layed back on his front. When the



River Guard Smiles at a Teen, but Carries a Gun for Peaches

The above figure of the [100] zone projection can be used to identify the nature of the interfacial reaction. The interface was found to consist of a mixture of the intermetallic and the metal. The intermetallic was found to be a mixture of the metal and the metal. The intermetallic was found to be a mixture of the metal and the metal.

gills were found a few minutes later, in all but one of the "rotations" on the side of the head. Although in correct position, the trout's ventral fins were closed against the brownish and lighter colors of the scales.

Control Hepting, Spanish Style

It grew cold that night in the mountains, and when questioned I learned to use the wooden chairs made with a horizontal board under it. A long wooden cross both hands to the floor with slots that could be used to place their legs, and even their heads, just

From time to time the bushes are carefully cut back, the growing material, which is spread out in beds of wood shavings, is dried in the sun. It

is a cozy way to sit on a cold night, particularly if one has an interesting partner to talk to.

One day I drove south from Madrid along the highroad that runs through La Mancha to Andalusia. Nine miles south of the capital, to the left of the road, a monument atop the Hill of the Angels marks the geographical center of the Iberian Peninsula.

This emphasized again the fact that Madrid is the novel of Spain. The town's central location probably helped influence Philip II in his decision to establish the capital there in 1561.

At Aranjuez, the bottle-green Tagus (or Tago), the river that empties into the sea at Lisbon (Lisbon), flows past the old Royal Palace that was originally built for Philip II. In the same year he moved his capital to Madrid. Restaurants on the riverbank serve the famous asparagus and strawberries of the region, and rowboats and sight-seeing launches ferry the opaque green waters.

The Andalusia highroad climbs in sharp turns out of the green oases of the Tagus Valley, into arid steppes again, and through La Guardia, a village formed almost entirely of cave dwellings. Rows of whitened doorways look out of sliced-off hillsides, and conical chimneys rise abruptly out of solid ground, breathing spirals of smoke into the blue sky (page 448).

The Land of Don Quixote

Soon the road straightens and levels, to run in stretches straight as a map maker's rule through the level plains of La Mancha, a region that embraces parts of several Provinces. La Mancha—what images that name evokes! For here rode Don Quixote and his squire Sancho Panza.

The great classic of Spanish literature—"the best novel in the world," said Marquand—has always been my favorite book. It is the most Spanish and one of the most universal of books.

Since the publication of the first part in 1605, the masterwork of Miguel de Cervantes Saavedra has gone through more than 2,000 editions and printings.

Don Quixote and Sancho spoke many of Spain's pithy proverbs. Castilian has changed much less since Cervantes's day than has English since Elizabethan times, and Spaniards use proverbs almost unconsciously in their daily speech.

At Madrilejos I saw my first Quixote windmill. The two stone towers' vanes were still, but later I saw them working, the white sails tracing a latticed arc against the cloudless sky.

The revolving arms of a working La Mancha windmill recit vividly the atmosphere of *Don*

Quixote. The sails sweep round with a rushing beat of air, the wooden shaft and bearings creak and groan, and the ground thrums underfoot. One can almost hear, over the rhythmic murmur of the vanes, the defiant shouts of Quixote as he charged the arm-waving giants, and the despairing cries of Sancho as his master was borne up on his lance and toppled from Rocinante (page 423).

With the black-smoked miller I climbed to the work chamber of a mill.

"All travelers from Madrid stop to look at the mill," he said. "Most La Mancha windmills are in ruins; few working ones are left, because power-driven mills in the big towns make it unprofitable to run these."

The building trembled and shook to the powerful sweep of the arms that passed and repassed the small window in the thick walls, throwing the lean face of the miller into alternating shadow and light. The round millstones growled as they ground the barley between their jaws.

Suddenly a gaunt greyhound bounded up the spiral stone stairs, adding another Quixote touch to the scene, for in the opening sentence of the novel Cervantes says that Quixote kept a lance, a shield, a nag, and a coursing greyhound.

Remembering the barber's brass basin that Don Quixote mistook for the magical golden helmet of Mambrino, I asked the miller whether such basins are still in use.

"Our father doesn't use the old brass I wish any longer," he said. "But they still employ them in some places."

"Have you heard the story of the barber and the walnut?" he continued. "Village barbers make the rounds every morning, and in fine weather they shave customers outside their own doors. This practitioner carried a walnut in his kit and gave it to the client to put in his cheek so that it would protrude and make it easier to give him a close shave."

Southward the road to Andalusia continues, through towns like Puerto Lápiche, also mentioned in *Don Quixote*, until it straightens again and points like an arrow across the fields to the church tower of Valdepeñas.

Grapevines Like Dry Soil

A vast web of vineyards surrounds Valdepeñas. Short grapevine stumps cover the plain with a network of regular rows that converge in the distance like tracks of a railway line.

Grapevines, like wine, do not like humidity, and they thrive in the loose, stony soil of La Mancha. Here they produce red and white Valdepeñas, the common table wine of Spain.

Shortly beyond Valdepeñas the flat country



Gay's Holliday: Lichens Portray Men and Monarchs Like These

The author found much fine scenery in the mountains of the province of Jaén, where he was a guest of the Duke of Alba. With plenty of game, the country was well suited for hunting. The Duke, however, was not a sportsman, and the author's only chance of hunting was to go to the mountains of the province of Jaén.

and, perhaps, outcrops in switchback lanes and tortuous Spanish curves. Thing Down Dog Pass, the gateway to Andalusia. At the foot of the pass the road runs along the edge of a deep gorge, and below, a small stream winds its way to the river.

Where Don Quixote Did Penance

THE MOUNTAIN MORA, where Don Quixote did penance for love of Dulcinea del Toboso. Red-trunked cork oaks cling precariously to the base of fissured crags. Huge shoulders of schist, covered with patches of rust-red and cadmium-yellow lichens, rise sheer from the rocky stream bed. In these surroundings of land of cave-dwelling bandits, or a paints for Don Quixote turning somersaults for love become perfectly credible.

Descending from the mountains, the road runs down a steep incline to the town of Jaén. Here, during the War of Independence, Spaniards won a decisive victory over Napoleon when they captured 22,000 Frenchmen with a force less than half as strong.

The roads to Granada and Sevilla meet at Jaén, and here the Government has built one of its comfortable guesthouses. These

stand at strategic crossroads or halfway marks all over Spain, usually at points that would not otherwise afford good accommodations for the traveler.

At Jaén, the traveler shifts accents, from "lisped" Castilian to the vibrant Spanish of Andalusia, a pronunciation more nearly like that of Spanish America than the southern accent does not become very marked. Lush, deep Andalusian foliage surrounds

the main road to Cordoba and Sevilla, sways west at Bailén, but I continued south on the route to Jaén and Granada.

Jaén is a city of olive trees, the silver-green olive trees which are the chief crop of the province. The olive groves gave way temporarily to open fields where red-stained buildings clustered around the openings of iron oxide mines.

The mining riches of Spain seem inexhaustible. Wolfram, tungsten, manganese, cobalt, nickel, copper, lead, and zinc are all abundant. The Phoenicians mined copper in Spain, and the Romans extracted what Pliny called "liquid silver from stones." Yet the mercury mine at Almadén remains the world's richest.

Jaén huddles at the foot of a dramatic

Olive oil, a superlative energy food, is rich in calories.

At the house of the proprietor of the olive grove I ate the regional dishes: *mejor*, bread crumbs fried in olive oil; and a salad of orange slices steeped in oil.

Presses Squeeze Oil from Olives

To see the oil extracted, I went to an *almazara*. At the entrance to this mill an enormous mass of blue-black olives rose to the height of the roof. Inside, a huge circular roller ground up the entire fruit, including the pit, into a black gruel.

Workmen then spread the heated paste on circular plied mats of *esparto*, a tough grass that grows in mountainous country; which is also used to make baskets, harness, rugs, and myriad other things. Threading the mat on the central column of a hydraulic press, they stacked others over it like a pile of flapjacks.

Already the man-high pile nozed oil, pressed out by its own weight; this oil and that from the first hydraulic pressing make the top-grade olive oil. The second and third pressings produce successively inferior grades of oil.

From the press the oil runs into a series of tile-lined vats. As it flows from vat to vat, water drains off at the bottom, and workers skim floating impurities off the top. The yellow-green olive oil, thus naturally settled and cleared, is known as *virgen* oil. Connoisseurs prefer this oil for cooking. Mechanical and chemical refinings later produce all stages of purity to the colorless, tasteless medicinal oil.

From Jaén the highroad continues through the mountains to Granada. On strategic high hills throughout this region stand square-sided stone towers. On these the Moors lighted signal fires to communicate from point to point.

Ruins and structures all over Spain record the passing of Romans, Visigoths and 500 years of the Moors, all of whom have left their mark on the rich culture of the land.

On the rim of terraces under the white line of the snows, Granada lies at the foot of the *Serra Nevada*. Above the city, on its forest-clad hill, stands the Alhambra, the sprawling fortress-palace of the Moors. Completed in the 14th century, the Alhambra remained the stronghold of the African Moslems until the reconquest of Granada by Ferdinand and Isabella in 1492.*

At a time when nearly all Spain suffered from a severe drought, Granada was green and fresh with running water. The Moors built aqueducts and conduits to bring mountain spring water from the town of Alora to

the cisterns and fountains of the city, and the system still works.

The downtown business section of Granada is modern. But if one climbs the steep hill to the Alhambra and passes under an old arch into the dark woods, one enters another period in time. In the somber twilight under the trees, students bend over books on roadside benches and lovers walk hand in hand along the paths.

I entered the confines of the Alhambra through the great Justice Gate, a spearhead-shaped opening in the walls in the base of a massive tower.

In the spacious courtyard between the Moorish palace and the ugly unfinished Renaissance palace of Charles V, I saw groups of visitors, each with a guide intoning history in the language of his flock.

The Alhambra consists of a sprawling succession of rooms, porches, towers, galleries, and courtyards (pages 430, 442-3, 454). On the walls delicate calligraphy traced in stucco gives an air of fragility to the structure. From ceilings hang stalactites of plaster. I found these oppressive in their cocoon excess; in contrast to the light and airy feeling of the pierced windows and arches, the heavy treatment of the ceilings weighed me down.

A plaque marks the site of rooms where Washington Irving lived while writing his *Alhambra*. It must have been a pleasant place to live and write, overlooking the gardens and the city far below.

Nightingales Sing in Alhambra Gardens

One night I looked down on Granada from the hill of the Alhambra. From the balustrade on which I leaned, the hill dropped sheer to the first tiers of houses on the upper levels of the city. At street corners old lamps on scrollwork brackets threw keystones of yellow light divided by a black cross of shadow on the whitewashed walls. The city lay quiet, so still that the songs of nightingales rose clearly in the night.

Here in the Alhambra gardens and woods I heard these European night singers for the first time. Their liquid song resembles that of our mockingbird, but seemed softer, sweeter, less metallic. It was spring when I was in Granada, and several nights I heard three or four amorous males singing at the same time.

The Alhambra looks across a ravine to the old hillside quarter called the *Albalein*. In its narrow, steep streets, balconies blossom with

* See in the NATIONAL GEOGRAPHIC MAGAZINE "On the Bypaths of Spain" March, 1928, and "From Granada to Gibraltar: A Tour of Southern Spain," August, 1928, both by Harry A. McBride.

pots of geraniums and carnations, and copper-smiths ply their trade (page 447).

In idle plazas and at street intersections domed structures cover *aljibes*, the underground water cisterns built by the Moors. Subterranean conduits bring fresh water to the system of cisterns, and people draw water up through a door in the cupola as from a well.

About 2,500 of Granada's 166,000 inhabitants are Gypsies. To see them one must climb still higher from the Albarrin on the road to the Sacro Monte. Here they live for the most part in whitewashed caves hewn in the soft rock (page 446).

Gypsies have been in Spain so long that no one remembers exactly when they first appeared. By now their dark good looks, spit curls, flaunted dresses, and abandoned dances have become part of the Spanish tradition.

Spanish Gypsies are a bold, insouciant lot. They speak with the familiar *tú* immediately on meeting one, and have a glib tongue.

"All Gypsies," they say, "are direct descendants of Jesus Christ, and for that reason we are privileged to live without having to work."

Out of the green valley of Granada and over arid hills I drove east toward the Mediterranean coast and Valencia. The automobilist in Spain must look out for big stones left on steep roads by carters. Drivers use the paving-block-sized stones for chocks when they stop their tandem mulecarts on a hill.

The road from Granada joins the main north-south Mediterranean coast highway at Puerto Lumbreras. Just before entering this town I stopped at a thatched shelter to watch women pack mounds of white eggs in straw for shipment to Valencia and Barcelona.

One countryman, wearing a black pleated smock and sitting cross-legged on (an) saddlebags, rode up (page 436). Eying my license plates, he asked, "French?"

I told him I came from the United States. Suddenly lapsing into English, he said, "I once spent four years in Ohio."

North along the coast the road runs through Murcia, center of a fertile plain crisscrossed with irrigation canals originally laid out by the Moors. Noted for its silk production since the Middle Ages, Murcia is the world center for silkworm gut, the filament used in fishing and for some surgical sutures.

To make gut, cultivators do not wait for the silkworm to spin its cocoon. They take the worm at the moment it prepares to spin, kill it and toughen it by immersion in a vinegar solution, then split it open and draw the two silk sacs out into threads 12 to 16 inches long.

Farther north I passed through *la che*, with

its forests of palms. Growers tie cloths around the palm fronds to keep them from the sun. The fronds, almost bereft of chlorophyll, remain a pale white for use on Palm Sunday.

Then comes the port of Alicante, and finally the flat *vega* (cultivated plain) of Valencia.

From Alicante north, people speak Valencian, a dialect of Catalan. Catalan has nine vowel sounds, including two *e*'s, three *i*'s, and two *o*'s.

For miles around Valencia the flat country is a succession of rice fields. Vivid green stalks project from blue water as far as one can see, and stooped workers standing knee-deep in water increase the similarity to an Oriental scene.

Close to the big seaport stretches the lagoon of Albufera, a large fresh-water lake. Separated from the sea by a narrow neck of land, Albufera is rich in fish life and aquatic birds. In season, duck shooting becomes a major occupation and pastime here.

Canals lead from the lake to villosos and l'oulets, and sailing boats with triangular sails appear to be sliding along on dry land when progressing across the flat landscape.

How to Catch Baby Eels

At Perellonet (the Valencian names sound strange after Castile), at one of the outlets to the sea controlled by sluice gates, I watched fishermen dip up *angular* one night. *Angular* are two- to three-inch evers, the transparent young of eels.

The scene was like something from a Japanese print. Two watering lines of light showed where fishermen, in boats with candle lanterns, scooped up the invisible evers by making methodical sweeps with a line-meshed *saon* dip net.

Fishermen must throw them in water with a pinch of powdered tobacco.

"The nicotine kills them," one man told me. "Then we boil them for a minute or two and dry them between folded cloth."

Thus prepared, they look like bean sprouts or dry noodles. Restaurants fry them in olive oil seasoned with garlic and hot peppers.

Valencia is one of Spain's many gastronomic oases. Here one may get graded cuttlefish, fried squid, and broiled Dublin prawns. But the great local specialties naturally center around rice, prepared in twenty ways. The *paella* leads all the rest. *Paella*, a meal in itself, is a noble dish of rice flavored with saffron and contains chicken, squid, mussels, clams, crayfish, prawns, and snails.

I had always thought I could hold up my end at table, but I found I was an object of concern to my Spanish friends.



Valencian Festival Queen Displays Golden Crown, Hair Skewers, and Sequined Lace Skirt.
Her hair skewers are made of gold. Valencian lace is made of the Malva yarn. Lace is
up to 100 years old. The Valencian Festival is the most famous festival in the world.



¹ Wineskin, Drunkers Need keen Eyes,
Steady Hand and Purse'd Lips.

At the same time, the fact that the *Chlamydomonas* cells are able to grow in the presence of the *Chlamydomonas* cells, which are not able to grow in the presence of the *Chlamydomonas* cells, is a clear indication that the *Chlamydomonas* cells are able to grow in the presence of the *Chlamydomonas* cells, which are not able to grow in the presence of the *Chlamydomonas* cells.

• Sport's Live joined "It's all the Sea" Has
Spreading Horrible Cows

The first of these papers (Dowd and Glick, 2001) uses a 1990-1995 data set to examine the relationship between the size of the health care industry and the rate of growth of health care expenditures. The authors find that the rate of growth of health care expenditures is positively related to the size of the health care industry, and that this relationship is stronger for the private sector than for the public sector. The second paper (Dowd and Glick, 2002) uses a 1990-1995 data set to examine the relationship between the size of the health care industry and the rate of growth of health care expenditures. The authors find that the rate of growth of health care expenditures is positively related to the size of the health care industry, and that this relationship is stronger for the private sector than for the public sector.





The Giralda Built by Moors. Belonged to Christians, Is Now a Cathedral.

THE GIRALDA, A TOWER BUILT BY MOORS, BELONGED TO CHRISTIANS, IS NOW A CATHEDRAL. THE GIRALDA, A TOWER BUILT BY MOORS, BELONGED TO CHRISTIANS, IS NOW A CATHEDRAL.



6

From the Arabic Word for Red Came the Name of the Alhambra

The word "Alhambra" is derived from the Arabic word "al-hamra", which means "red". This is because the palace was built on a hillside with red soil and red-tiled roofs. The word "Alhambra" is also the name of the city of Granada, which was founded by the Moors in the 10th century.



Beyond the Alhambra's Hill Stretch Sierra Nevada Snows

From the top of the hill, the view of the city and the mountains is a beautiful sight. The Alhambra Hotel is a prominent feature in the foreground, and the Sierra Nevada mountains are visible in the background.



View of the city of Madrid, Spain, showing the main street, the Plaza de España, and the Cathedral of Toledo.

Capricious Kards and Kilted Skirts, Lancers' Dance, World's Fair, 1893

Illustration of the Lancers' Dance, World's Fair, 1893. The dancers are wearing elaborate costumes, including white dresses with red accents and red hats. The background is a dark, textured wall.





2014年12月24日

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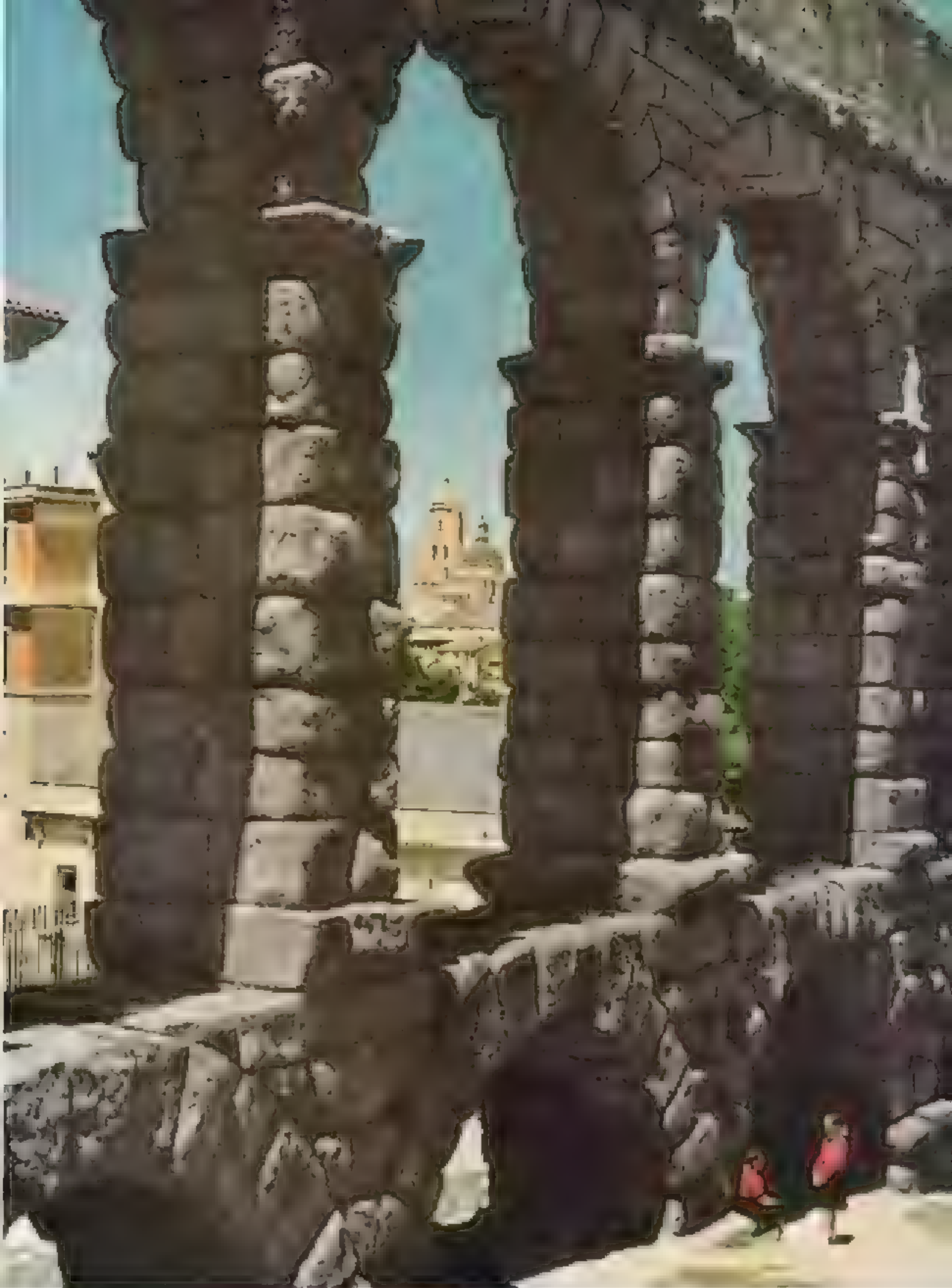
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Earthen Homes of Cave Dwellers Stay Cool in Summer, Warm in Winter

Small cave dwellers in the Southwest. The cave dwellers in the Southwest are known for their earthen homes, which are built into the side of a cliff or cave. These homes are designed to stay cool in the summer and warm in the winter.



Graceful Arches of Segovia's Roman Aqueduct Have Stood for 21 Centuries

View of the Segovia Roman Aqueduct, a masterpiece of Roman engineering, in Segovia, Spain. The aqueduct, built in the 1st century AD, is a UNESCO World Heritage Site and a symbol of the city's rich history.



Alfred's House, Puerto Rico, Heart of the Impassioned Capital City, Symbolizes Spain's Vindictive and Cruelty

They and I sat last in the Snows and Sereas at the City of the Snows

From the Snows and Sereas at the City of the Snows





Seattle's Black Churches, Source of Material etc., Take Southern Sun to England and Scotland

The photograph is a black and white photograph of a group of people, including children and adults, standing in a line outdoors. They are holding large, flat, rectangular objects, possibly mats or blankets, which are covered with a dense pattern of small, colorful, circular objects (possibly beads or buttons). The background shows a grassy area and some trees.

Oranges and dried Lemons: Two Valencia Sweet Lemons
 You may see a lot of these in the market, but they are not the same
 as the ones you see in the market, and they are not the same.



His Three-year-old son is made of Patent Leather
 and is a very good boy, and he is a very good boy.





Spain's Finest Example of Moorish Architecture Is the Alhambra's Court of the Lions
 From the top of the tower, the view of the Alhambra's Court of the Lions is a masterpiece of Moorish architecture. The Alhambra's Court of the Lions is a masterpiece of Moorish architecture. The Alhambra's Court of the Lions is a masterpiece of Moorish architecture. The Alhambra's Court of the Lions is a masterpiece of Moorish architecture.

"You hardly eat enough to keep alive," they would say. "Eating is like scratching—it's all in getting started."

Valencia specializes in fireworks. So much is the city addicted to "artificial fires" that I could not be sure, when approaching Valencia by night, whether flashes beyond the horizon came from lightning of an approaching storm or from rocket explosions.

In the spring I returned to this third city of Spain for the celebrated *Fallas* de San José (St. Joseph). Festivities last for five days and center around elaborate humorous or allegorical life-size figures, in papier-mâché and wax, built on stages at street intersections.

The Valencians work all year to plan and build these fallas, or graphic satires; but all of them, big and little, go up in bonfires on the night of San José, March 19.

Men soak the paper, wax, and wood structures with gasoline, and in a moment the falla becomes a roaring conflagration. When I wondered aloud why the pavement beneath did not crack with the heat, friends told me that each falla rests on a layer of deep sand.

As the fallas burn, rockets scream upward from the roped-off central square to explode with window-shaking noise and brilliant colors. The noise builds up until, with the final salvo, everything shudders and quivers under the terrific impact of sound. Valencians love it.

"When our children are only two or three years old," a municipal official told me, "we take them in our arms and run with them under strings of exploding firecrackers, dodging the falling fire, so that the young ones will get used to it."

Bonfires at a Wedding

Fireworks and bonfires go with Valencians from medieval times. Many Valencians served in the army of Cesare Borgia, and on the occasion of the marriage of Cesare's sister Lucrezia to the son and heir of the Duke of Ferrara in 1501 the Valencians lighted bonfires in the plaza of St. Peter's in Rome.

Valencians display artistic talent in things other than fireworks. Here the first book printed in Spain appeared in 1474. The novelist Vicente Blasco Ibañez and the painter Joaquín Sorolla y Bastida were Valencians. And virtually every fine house in Spain possesses examples of the exquisite furniture turned out by Valencian cabinetmakers.

Center of the richest agricultural part of Spain, Valencia prides itself on its oranges; yet I found that local people prefer the thick-skinned navel oranges of California origin. Conversely, some Americans would rather eat Valencia oranges (page 453).

When I think of Spain, I like best to remember Madrid at Christmas and New Year's time. In the Plaza Mayor, the old enclosed Great Square, booths spring up then to sell holly and other Christmas greens. In this square lingers the flavor of *castizo* Madrid. "Castizo" is a difficult word to translate; it means "pure," "authentic," "traditional."

On one side of the Plaza, above the ponderous arched galleries and the uneven flagstones rise twin spires that display two dials: on the left a clock, and on the right a huge barometer which always forecasts the weather correctly. The hand invariably points to "Variable."

At night an old woman sat under an arch roasting chestnuts, her face lighted ruddily by the charcoal brazier at her feet.

"How do you sell the chestnuts, señora?"

"A fat bitch apiece, sir."

A fat bitch is ten cents; a plain bitch only five.

Noisemaking on Christmas Eve

I bought some chestnuts and moved on. Under the gallery they were selling tambourines and drums, for Christmas Eve means a time of noisemaking in Madrid. I looked at one two-foot-wide tambourine covered with black script; the maker had used the vellum page of an old missal.

Streets surrounding the Plaza Mayor run on a lower level. From them the walls of the buildings forming the closed square rise like the ramparts of an ancient fortress.

To support the tremendous weight of stone the massive walls are thicker at the base, so that they lean inward from the sidewalk like the pylons of an Egyptian temple. Small, heavily barred windows pierce the forbidding facade, and a flight of worn steps, called the *Graderillas*, leads upward through an arched embrasure to the square.

As I watched, two men muffled to the chin in cloaks emerged from the darkness of the stairs and walked after their shadows in the yellow lamp light.

Farther down this street I looked through the misty window of Botín's restaurant at the pale smug faces of suckling pigs, nuzzling each other for a turn at the 200-year-old oven inside. All about me corks cowered. Madrileños were fattening them for the New Year.

On New Year's Eve I went with three friends to the Puerta del Sol (page 450). By a quarter to 12 it seemed that all Madrid had crowded into the square. People converged on Sol from side streets, and more surged up out of subway entrances. Some were beating



This Is Spain's Granada Gypsy Dances in Her Cavern Home

At the center of the dance was a large, dark, and somewhat dimly lit cavern. The walls were covered with the same rough, rocky material that we had seen in the other caverns. The floor was also made of the same material, and the air was thick and warm.

and dances, and during the evening and dancing. As daylight approached, the men and women who had been dancing in the caverns of the night were seen in the streets of the city.

We took a better way to the town, and after leaving the caverns, we found the same rough, rocky material that we had seen in the other caverns.

The old man who had been dancing in the caverns of the night was seen in the streets of the city.

As the old man who had been dancing in the caverns of the night was seen in the streets of the city, we found the same rough, rocky material that we had seen in the other caverns.

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Arizona Sheep Trek

BY FRANCIS R. LINT

With Illustrations from Photographs by the Author

I SHALL not soon forget the sight of Rosalio Lucero, the herder. His ravined brown face is a relief map of his Arizona hills. At more than threescore years his hair is still as black as the charcoal embers of his campfires, and his teeth are as white as bleached bones on the desert. Years of leaning on a herder's staff have sculptured his shoulders into the curve of the staff itself (page 474).

Rosalio dresses in dusty bib overalls and jumper, which flap grotesquely as he runs in pursuit of an errant sheep.

No, Rosalio does not remotely resemble a hero; yet twice a year he performs a hero's job, guiding his migrating herd across desert and mountains.

Heat and Snow Goad the Herd

By mid-April Arizona's Salt River Valley is beginning to scorch. For men there are excelsior and fan cooling systems, but for sheep, grazing in irrigated fields, the only air-conditioning lies in migration.

From 1,100-foot-high pastures around Phoenix the herds start trekking to cool summer pastures above 8,000 feet in the White Mountains, close to the New Mexico border (map, page 459).

For sheep and herders the annual trek means some 50 days of grueling struggle upward each spring, and an equally exhausting journey downward when autumn's snows drive them from the mountains. Climate's stern demands keep the herds trail bound more than a quarter of the year.

The migrants follow the Haber-Reno stock trail, a long, pathless strip two to four miles wide. Here and there the trail is so tangled that even experienced herders occasionally become lost (page 458).

Only a few weed-grown roads cross the trail along most of its length. For 50 days we touched no private property. Fences are 50 miles apart.

On the trail I was to see the seasons reversed within a week, ice succeeding summer's fiercest heat. Lizards sun-bathing in the desert gave way to deer bounding through slaty forests. Cactuses dissolved into giant pines.

To take pictures of the trek, I appeared before sunrise on April 16 at the camp at the Paradise Stock Farm near Chandler, Arizona (page 460).

My gear was stowed aboard a burro (page 477). Our expedition's seven pack beasts were placed in charge of Pablo Chavez, a 42-year-old *campesino*, who was to make our fires, cook our meals, and tend the burros for the next 32 days. Cheerful, Pablo had the strength to load and unload his seven recalcitrant burros four times a day, and the ability to shoe a horse or dress a wound.

As the herd poured out of the home pasture, its owner took a tally showing that Rosalio had 1,547 wards, including a few goats selected for leadership (page 477). All the sheep were ewes, freshly shorn. No rams made the trek on foot; pampered males went by truck and railroad.

Into an unpaved highway the sheep flowed like a river of fleece. Soon 6,000 hoofs churned up a dust cloud which hung over the herd like a lazy balloon (page 463). Ahead and behind, more dust clouds identified other trekking herds.

Rosalio, who had to walk with the sheep while Pablo put shingles on the laborer's back, could not cum all any long. By night he was coughing and exhausted.

Animal Bridge Spans Salt River

Our first stretch of desert, which we entered on the second day of the march, provided relief, for it was less dusty. That night we camped beside the Salt River and drifted to sleep on the tinkle of sheep bells.

In past years herds swam the river, losing occasional members; but we had the advantage of the sheep bridge, a narrow suspension span designed for stock (page 461).

When, on our third morning, the herd swung into a corral beside the bridge, Pablo laid out his camp and began cooking in restaurant quantities, for he had extra mouths to feed.

First of our guests were the herd owner, his wife, daughter, and son-in-law who drove in with canned goods for the herders and salt for the sheep.

Next, a Federal ranger arrived in pursuit of a census matter. As part of the sheep trail crosses the Tonto National Forest, for which the Forest Service charges a fee per head, the bridge provided an opportunity to count the herd as it streamed across. Now another outfit arrived with a herd encumbered with a mortgage. With it came a finance company's agent to tally his mobile collateral.



One of Arizona's Loughe-Trails, the Abandoned Reno Route, takes the Horse Trail full
 from the base of the hill to the top of the mountain. (Photograph by J. H. H. H.)



Drawn by Harry W. Johnson and Fred W. A. Smith

The Sheep Trail Ziggags Across 200 Miles of Arizona Wilderness

Twice a year thousands of mountain men follow the Heber River stock trail. Each spring they quit the desert floor near Phoenix and seek cool pastures in the White Mountains. In autumn they retrace the course. Their "highway" is a narrow, packhorse strip of public domain and private land so tangled with canyons and equipments that herders often get lost. Rams travel by truck and train.

Literally, the bridge was a countinghouse.

At noon we filled our plates with frijoles, mutton, and pan biscuits, and for an hour the men waved woolly yams about the trail. This was the herders' last social fling for weeks.

Bridge Shakes; the Herd Stampedes

Presently Rosalia opened a central chute leading onto the bridge. The herd leaders hesitated, but the impatient woolly mob stampeded them onward (page 476).

Shakily hung from cables, the bridge writhed and trembled, terrifying the sheep. Running, pushing, and bleating, they raced two abreast in a narrow way designed for single file. When they approached solid ground they leaped for joy, citrus fashion (page 464). Harnes showed fear of the vibrating span by freezing in their tracks. It took the herders half an hour to tug them across.

Now good-byes faced the air; the herd was off into the wilderness.

We stopped at 9 that evening. Pablo hobbled the Lurros, opened the pack boxes, gathered wood, and lit a fire. Camped corn, frijoles, coffee, and muddly's remaining beer made out meal. Sorghum syrup was dessert. Then we tossed the scraps to the dogs, Boots and George (page 474), and washed the dishes. With his flashlight Rosalia checked the herd, bedded down around camp.

It was 10:30 before we fell into our bed rolls.

Campfire lit a circle around us. A 40-foot saguaro cactus stood watch on our left.* Opposite it a scarlet headed ocotillo, one of the candlewoods, swayed in the breeze like a Hawaiian dancer.

All about us was silence, but not emptiness, solitude, but not loneliness. There was no noise or confusion. Civilization's worries

A glance at the sky revealed the glory of the desert night. The stars, magnified by clear air, burned in brilliant array. By their light I could tell time on I scribble notes. On other nights, by moonlight, I could actually read.

We arose at 5 for breakfast of pan bread, stewed fruit, and coffee. With the first gray light Rosalia and I started off with the herd, leaving Pablo to pack the burros.

Sunrise brought a cloud of goats swirling blackly around the tender faces of the sheep. Half an hour of this torment stopped the herd. Each member buried her head in her neighbor's flank and refused to budge.

Rosalia shouted threats to no avail. Nor did it help when he tossed a pack box and even his blue jumper into the air. Finally he signaled his dogs into action. Then the mass of goat-pestered wool drifted a few hundred yards and halted again (page 465).

*See in the National Geographic Magazine "Saguaro, Cactus Camel of Arizona" by Forrest Shreve, December, 1914, and "Saguaro Forest" by L. L. Shreve, April, 1917.



The Author Before His 52-day Ordeal

After the trek Mr. Lin went for 11 hours. As soon as we had passed the mountains he started to get panicky. He knew that in some places there were no water, and that was the worst thing we could have.

New Road had been a good one. It was a good road, but it was not a good road for the most part. It was a good road, but it was not a good road for the most part.

Some of the plants he saw were the same as the ones he had seen in the mountains. I have seen a lot of them, and I have seen a lot of them. I have seen a lot of them, and I have seen a lot of them.

After the trek we had a lot of trouble. We had a lot of trouble, and we had a lot of trouble. We had a lot of trouble, and we had a lot of trouble.

On the way we saw a lot of things. We saw a lot of things, and we saw a lot of things. We saw a lot of things, and we saw a lot of things.

It was a good one. It was a good one, and it was a good one. It was a good one, and it was a good one.

Into the mass of jumping cattle, too, we tried to get. The sheep were all unaware of their danger. Suddenly one of the lead ewes, stung by snakes, leaped into the air as if in distress. Landing on her own people she tried to retreat across their ranks. A moment later the pursuers were blindly sheering her leaders away into the thicket.

Despite the war-cry, two sheep standing near me shot up and struck me in the back, jumping easily over its name understood. When I moved, each poise came to me like a needle stuck in fire. Turning my head I saw some of the other sheep, but I did not know what to do. I heard for a moment of peace, but it was not a peace that I could find.

For the sheep there was little we could do. In a few days their festering wounds expelled the snakes with impunity.

As the day I saw Road coming off a hill and over a ridge, the blazing plain of the morning. He had a lot of things, and he had a lot of things.

Next to the hill we had a lot of trouble. We had a lot of trouble, and we had a lot of trouble. We had a lot of trouble, and we had a lot of trouble.

Now the sheep were all in a state of confusion. They were all in a state of confusion, and they were all in a state of confusion.

calves before us lay Tonto Basin, one of America's wildest sections.

In the morning I let Rosalio go his way alone so that I might stay and photograph Pablo packing his seven burros.

Perhaps some herders are lazy, but not Pablo. Morning, noon, and evening he loaded or unloaded all the heavy kyack boxes, along with bedrolls, water kegs, shovels, and axes.

These packs carried virtually all the herders' personal possessions. Save for one vacation a year, they devoted their lives to the sheep.

Packing completed, Pablo fed his horse, unhobbled his burros, and set out to establish noon camp. We faced three days of tough going before we reached water at Tonto Creek (pages 469 and 471).

From Tonto Creek it was up, up into the foothills of the Sierra Ancha. For nine days we journeyed without sight of road, fence, or house.

Now the trail led us onto a tableland strewed with dry filaree, palo verde, and isolated cactus. At a higher level greasewood shrubs atomized the air with fragrance. Atop a giant mesa we found a sprinkling of junipers. The altimeter of changing vegetation registered our ascent.

One morning lizards played hide-and-seek with me as I advanced. Startled grasshoppers, jumping ahead, measured my strides.

Heat Pursues the Caravan

As the sun climbed, so did the heat. Capped between the Sierra Ancha ahead and the Mazateaks behind, our caldron boiled. At noon we found two thin palo verdes for shade. Burros, dogs, and humans, each sought relief in vain. Lying down, I exposed my shoe sores to the sun; I thought my feet would fry. We had no thermometer but the rising mercury of perspiration. Two days before it was 110° F. in the shade in Tonto Basin, and here it was hotter, with no shade.

Below our camp the sleep broke into tiny bands, each group sheltering behind a bush. It was 5:30 before Rosalio had the heart to start them moving.

As we were too hot and weary to carry canteens, I was surprised half an hour later to hear Rosalio ask, "You want a drink?"

Venturing into a darkening canyon, he led me to a small rock-lined pool. Lying on our bellies, we plunged our faces into the clear water. As I paused for a second drink, I caught the reflection of the dogs, drinking too.

Yellow jackets lit on the water, balanced themselves much like us, and dipped their heads. Their thick stems throbbled like pumps. We did not bother them, nor they us.

Thirst quenched, I discovered several thousand tiny eggs, shining like pinheads at the bottom of the pool.

Overtaking the herd, we encountered four rattlesnakes.

Woolly Army Routes Rattlesnakes

Behind the 6,000 hoofs of the herd, rattlesnakes were no danger whatever; they were dead or deep in hiding. But I often journeyed ahead, and so encountered many snakes; not once was I ambushed. Rosalio told me that in all his years no rattler had ever harmed him. To Pablo they were the "gentlemen" of the reptile tribe, always giving fair warning. He never went out of his way to kill one.

Occasionally we encountered sluggish, venomous Gila monsters. Tarantulas were common. Scorpions tried to camp in our blankets. By night sometimes Rosalio guarded the herd against marauding coyotes, mountain lions, and bears.

Three days out of Tonto Basin we entered Berego Canyon, a 200-foot-deep slash in a green-clad mountain. Scouting its isolated ponds of water, the sheep scrambled into the gorge. "Bial hau!" they bleated. Like the pipes of an organ, the canyon's red granite ribs gathered the sounds and tossed back echoes.

Amid this chorus, Rosalio detected a cry of distress.

"A sheep is strangled in the rocks," he said. "I go down."

I watched him, shoes in hand for sure-footedness, as he made a precarious descent down shelving, slippery rock to a ledge where a silly, self-trapped ewe stood dismayed by fear of an 11-foot jump. Not until Rosalio reached the ledge did the sheep make a panic-stricken leap for freedom.

Lessons in Herding

Amid the canyons Rosalio gave us a lesson in herding. I marveled at how well he kept track of all his charges as they spread out into three or four ravines. As Rosalio could not trust his dogs to round up all the strays, he had to scout each ravine, searching behind each bush and boulder. An uncanny ability to distinguish his animals' hoofprints from others helped this master tracker. In these wildlands, nevertheless, he must have walked four times the distance covered by his sheep.

Scarcely a day passed that Rosalio did not maneuver scattered brigades half a dozen times to hold his army together. Like a field general, he matched his forces out of difficult places with subtle moves.

I never ceased to wonder that Rosalio and Pablo got along so well. Other herders got



Sheep, Marching Across Arizona,
Black Roads, Air Dust clouds

The sheep are being driven from Salt Lake City to the coast of California. The dust clouds are so thick that the sheep can only see a few feet ahead of them.

Earning Their Salt by Desert Travel,
the Sheep Collect a Payment

At the end of the journey, the sheep are paid for their salt. The payment is made in the form of a small amount of salt, which is given to the sheep as a reward for their journey.





Sheep Express box at Channing the Santa Fe River Bridge in Taking Chickadee leaps to the ground

The box is made of wood and is painted red. It is used for shipping sheep and is located at the Channing the Santa Fe River Bridge in Taking Chickadee leaps to the ground.

Placed by Gads, the Sheep Bunch Up, Heads Down, in a Dry Wash, Rosalia and a Hog Start Then Moving

See also page 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000





The Great Sizer. Public Places That for Address Held. Five Times a Day the Packs on Unpacks the Boxes
A common scene in the town of Sizer, a common scene in the town of Sizer

In the Story Desert Pablo Shows His Horse Weekly



And Every Other Day He Makes Packed-up Picnics





Through Weird Cactus Pitfalls the Caravan Cautionously Threads Its Way

A caravan of pack animals, led by a man in a red shirt, is seen crossing a rocky, desert landscape. The animals are carrying large bundles, and the man is guiding them through a path lined with tall, thin cacti. The scene is set in a hazy, mountainous region.



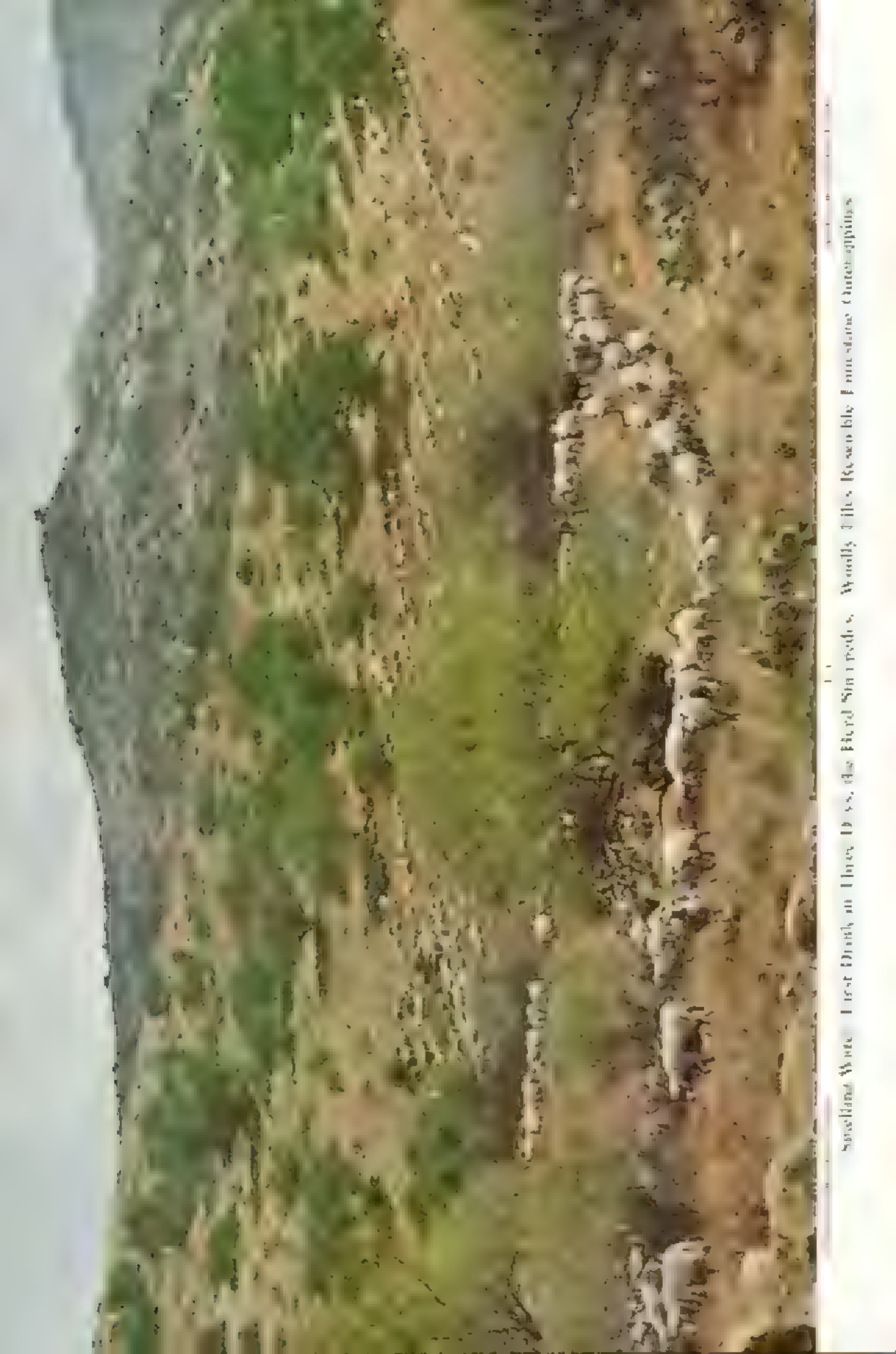
▲ Devo's Road to Life-giving Water
Is Paved with Browsing Cobbles

Each day, a herd of horses and a few people travel along this road to the water. The road is paved with small, smooth, reddish-brown cobbles that are found in the desert. The horses and people use the road to travel to the water.

▼ Roman Stays Inside a Barrel Cactus
Plucks Hairs from His Dog's Paw

Each day, a herd of horses and a few people travel along this road to the water. The road is paved with small, smooth, reddish-brown cobbles that are found in the desert. The horses and people use the road to travel to the water.





11
Sawald's View. First Look on Lake D. ex. the Hard Stone. Woody Hills. Resemble Pinnacles & Interappings



Shepherd and his flock in a field near the Sheep Pen, 1894.

Shepherd and his flock in a field near the Sheep Pen, 1894. The shepherd is standing in the center of the flock, holding a staff. The sheep are scattered around him, some facing the camera and others with their backs to it. The background shows a line of trees and a small building on the left.





4 Pablo Quits the Comforts of Camp
and Rides for Water

At the first sign of a dry season, Pablo, the favorite horse of the cowboy, is sent out to the water hole to get a drink. He is a very smart horse and knows exactly where to go.

5 Roslin Is as Devoted to His Dogs
as They Are Faithful to Him

At the first sign of a dry season, Roslin, the favorite dog of the cowboy, is sent out to the water hole to get a drink. He is a very smart dog and knows exactly where to go.



on one another's nerves and quarreled, but never these two Spanish-Americans, who had worked as a team for years.

Rosalio's old dog was not so deep, but seldom was there a meal at which he did not peel Pablo's potatoes or dry his dishes. Just as often Pablo helped Rosalia in the herd's emergencies.

At last out of desert and canyons, we stood on the summit of the Sierra Ancha. There we entered a new world. Manzanita shrubs wave a tangled glory atop the plateau. "Little apples of gold," Rosalia called the manzanita, because it bore a tiny fruit. It was like some lime, and each plant held clusters of urn-shaped fruit.

Rosalio even the herder, was unimpressed.

At last, he admitted, "The sheep can't get through. And it's too thick for them to get through."

We had paused to rest late one afternoon when the sky darkened and a shower set in. Pablo groped through the boxes for a Spanish almanac. For this day, May 9, he read the Arizona forecast: "Dry, with rusty winds."

Rain Proves Almanac a Liar

We were in the rain for a long time. Pablo said that rain was good for the sheep. It was a good thing for our herds. The rain was good for the sheep. It was a good thing for our herds. The rain was good for the sheep. It was a good thing for our herds.

As darkness settled, Pablo and I hauled logs and built a campfire. Struck by rain drops, the embers hissed and swirls of tinted smoke billowed up.

We said "Buenos noches" early. The rain's tapping fingers beat a tattoo on our tent.

Morning was sodden and chilling, and the rain was heavier than ever. Rosalia could not afford to rest; his sheep needed fresh milk. Taking his slicker and staff, he set out into the dismal dawn. Dripping trees and coming rain swallowed her and her lot.

Pablo went out to hunt his belated burros, while I stayed in camp to tend the fire. A cold gust of wind rattled the tent, and the rain changed to hail. White, icy stones pelted the Dutch oven, hot over the fire, and burst into steam.

Pablo's burros doddered into camp. Never had they appeared happy, but now each animal was a document of woe. Like silent monuments they stood, water dripping from each ear as from a trough. A donkey's ears are his only glory; now these had gone to half-mast. When rain and hail seemed unendurable, men swore, dogs whined, and sheep bleated, but burros stood silent, dripping.

Drenched and muddy, Rosalia returned, knelt by the fire, and scraped clay off his shoes. Lunch was a soggy affair.

By now the dog George was so chilled that he was shaking violently. When we retired for rest, Pablo covered George with a pack blanket and tucked him beside his own body.

Presently the wind broke the dunes and ditches we had built to protect the tent. Rosalia and I repaired them. Bailstones, bouncing like rubber balls, popped beneath the tent flaps and melted. So exhausted were Pablo and the dog that their sleep was never troubled.

No matter how miserable, the dog did not neglect his duty. Though Rosalia did not give his customary whistle on leaving camp that afternoon, George, shivering but faithful, took his place behind the man.

Town 50 Miles from a Railroad

Our last soggy slab of pan bread was gone. From the tent I watched Pablo, swathed in his black slicker, his hat dripping, mud clinging to his shoes, mix his dough in the rain and bake it in the Dutch oven.

That night the storm blew itself out. Trek resumed in the morning.

Now the trail carried us into Pleasant Valley, and here I left the herd and visited Young, a ranchers' community of two stores, one church, one school, and some 500 people.

It would be difficult to imagine a more isolated community. Young is 50 miles from a railroad or a doctor. At the time of my visit it was connected with the world by one shaky telephone line.

Cut off as they are from the services of electricians, plumbers, and other artisans, the citizens have made up for the loss by developing a community spirit. I found them pitching in with hammers, saws, and paintbrushes to build a new wing to their church. With similar enterprise they equipped a lending library.

Leaving the comforts of town life, I caught up with the herd.

Sheep Hurdle Awesome Barriers

In our path stood Ramer Canyon, a miles-wide gorge strewn with twisted pines, ravines, and ridges. In places the underbrush was so thick that we could not see a dozen sheep out of the herd. Most of the time Rosalia had to run to keep track of his charges.

Next, the Mogollon Rim, a severe escarpment, rose like an exaggerated copy of the Hudson Palisades. As I looked ahead I wondered how the herd was going to surmount this long, tremendous barrier.



Sheep Steeply. A view of a Snowy Mountain

Sheep Steeply. A view of a Snowy Mountain. The mountain is covered with snow and the sheep are grazing on the slopes. The view is from a high vantage point, looking down the length of the ridge towards the horizon.

The man Rosita and others used his gun for dogs. He had run chased the sheep and the dogs. But at the Rim he set the dogs in the herd and turned the dogs over the herd. Rosita and the others were then began sealing the mountain.

About the center of the mountain we found the cry of a lamb in distress. We found the sheep in the animal world between two rocks. These would have been the last of the herd had not weathering proved a great compassion.

I found the man showing to give first aid to the injured, searching for the lost, and carrying the weak across the mountains. He was not on reaching the top of the Rim was a high mountain and the man was a good man and a good man.

Once beyond the Rim we found our way near Heber, summer headquarters of the great Salt River herd owners. In their corral we held reunion with other newly arrived cowboys.

It had been a tough season, and tales of hardship were many. We learned that the herd, lost in Round Canyon, had wandered five days in the desert until a drought was in the land.

Another, bitten by a rattlesnake while climbing a ledge, had wandered in the mountains to Heber. A cowboy, bitten by a snake, was a sheepman. One had been lost in the mountains and was a cowboy. One had been lost in the mountains and was a cowboy.

Danger: Logwood

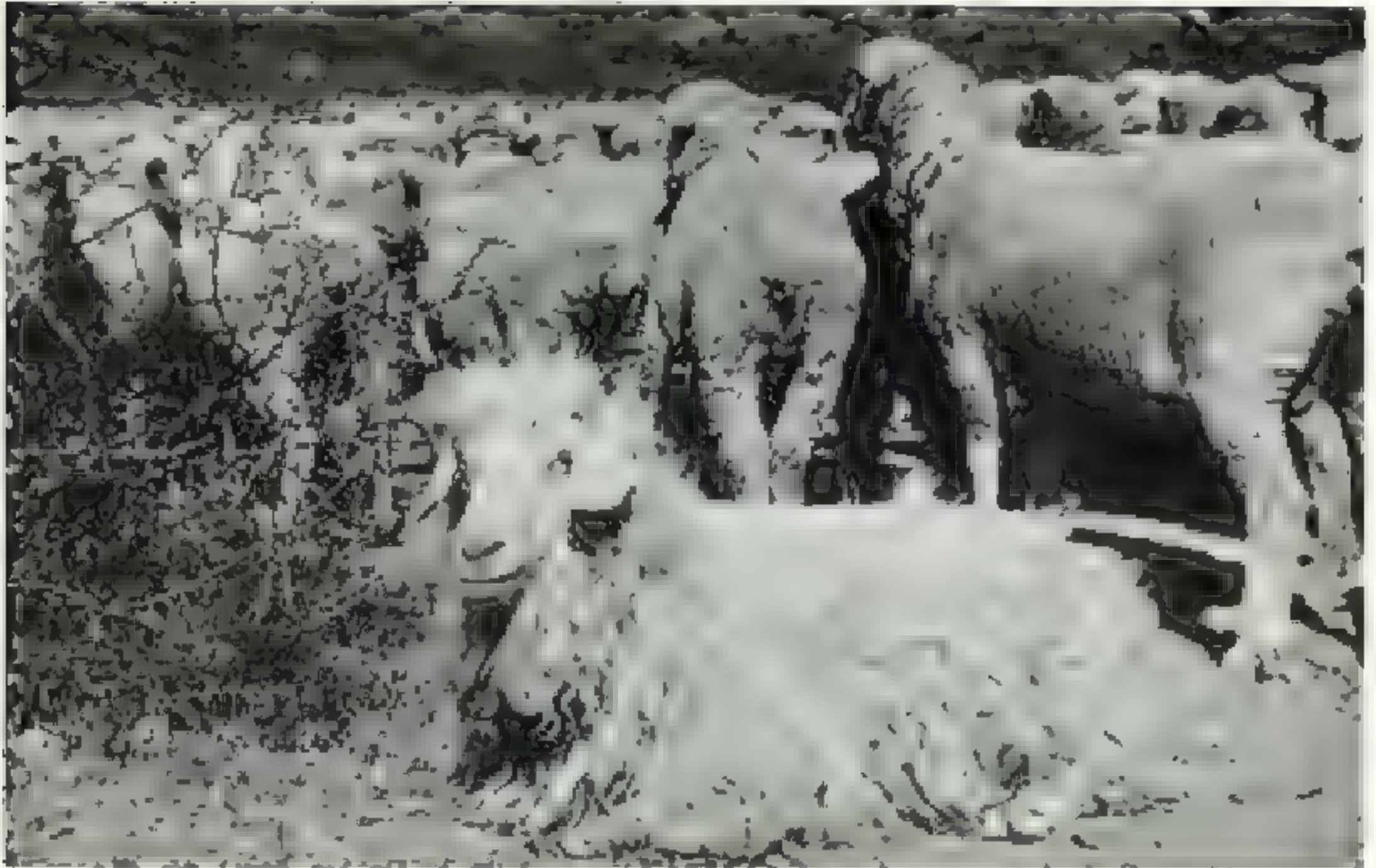
One and danger from the north. Forward by the north. The poisonous herb, if eaten, causes the nervous system of livestock to be paralyzed. The herb is found in the mountains. The herb is found in the mountains. The herb is found in the mountains. The herb is found in the mountains.

The trail swung into a new plain in August. We skirted Dry Lake and Snow Lake and entered the Fort Apache Indian Reservation. Now we were at an elevation so lofty and cool that ice formed in our washbasin at night.

On June 3 we arrived at the home range which lies in the White Mountains between McNary and Saffordville.

For the first time the sheep had been in the mountains. Now they would run across the mountains and the mountains would be a stream.

The first of the men to take the final tally was the herd owner. We counted the flock



Sabu, a Wise Old Leader of the Herd Thoughtfully Takes His Rest Sitting Down

Second, the model is estimated using the full sample of data. The effect of the 1990-1991 recession on the relationship between the variables is not estimated separately. The model is estimated using the full sample of data, and the results are reported for the full sample. The model is estimated using the full sample of data, and the results are reported for the full sample.



Publi's Menacholy Burros Drink Their Fill from Signature Creek

THE UNIVERSITY OF CHICAGO PRESS

Kew: The Commons' Royal Garden

BY THOMAS GARNER JAMES

With illustrations by Vernon G. Gribble, Photographer B. Path, Inc. & Co.

A MEMORANDUM of the London Natural History Society reported the reaction of a Kensington sparrow to one of World War II's first air raids.

It fainted.

Having seen for myself the solicitude which Britain bestows on its tenderest wards, I can appreciate the outrage of her Nature lovers when a Nazi bomb blew the glass out of Kew Gardens' Temperate House, exposing to an English winter several thousand specimens of plants never meant to suffer such rudeness.

While we walked together through the Gardens, Kew's Director, Sir Edward I. Smith, C.B.E., F.R.S., told me how Britain's wartime command had assured him priority for replacing the precious plants. Racing against both the war and the weather, the gardener-scientists saved 40 percent of the blast's victims.

Such stories illustrate what to me is the essential wonder of one of the world's great centers of research. The Royal Botanic Gardens at Kew, Commonwealth headquarters for plant study, clothe vast learning and vast economic importance in disarming garments of fragrance, color, bird music, and deep humanity.

Little Birds and Little Britons

Little birds and little Britons play delightfully around each other on Kew's green lawns beside unparalleled collections of plant exotics.

For an entrance fee of one penny, the visitor can see 45,000 different living species from every botanic beauty spot on the globe, and gain admittance to a university whose tests are flowers. No signs or permanent fencing tell him "Keep off." If all paths to learning were only as pleasant!

Nearly two million visitors pass through Kew's 288 acres of beauty annually. But even while they manifest a very personal pride in its loveliness, few of them realize how much they owe to the "green fingers" of the modest scientists working here. For Kew has given generations of Englishmen not only much pleasure and much instruction, but even their means of existence.

Almost unnoticed behind a garden hedge or a mellow brick wall are the seedbeds in which botany's "luck-room boys" have nurtured work-changing industries.

The bombs aimed at Kew's acres of glass recalled Axis campaigns to capture the cin-

chona and rubber plantations of the Far East. These great raw-material-producing industries, as do others in Europe's tropic colonies, hinge on Kew.

Kew in Lilac and Rhododendron Time

Come down to Kew in lilac, or any other time. It is less than 10 miles west of London's City.

Although to Londoners the weeks of lilac and bluebell blossoms are the most popular, Kew presents her natural-history lessons at all seasons. The peacock butterflies of autumn and its chrysanthemums are as gorgeous as spring's tulips and magnolias or summer's rhododendrons (pages 483, 488, 494, 496, 497).

In the woodlands laid out by George II's Queen Caroline, an extraordinary variety of birds live throughout the year, feasting on Kew's fruits in autumn and at all times on crums brought them by human friends.

A special committee of the Ministry of Works publishes an annual report on the birds seen in Kew and in other of the royal parks.

The enormous Herbarium at Kew is the most famed of all world institutions devoted to taxonomy—the identification and classification of plants (pages 481, 501).

In its tiers of shelves, 6,000,000 sheets of plant specimens are preserved and grouped by classes, orders, families, genera, species, and varieties. Eighteen divisions of the globe provide a geographic cross index to the collection, which is particularly rich in type specimens.

The figure of 6,000,000 is a rough estimate, based on counts of sample sections, for no one knows the exact number.

"If I put one man to work on it," Sir Edward said, "I estimate that it would take him at least 42 years, Sundays off, to examine all the specimens of plants we have preserved in this building."

The pressed and laminated plants are supplemented by special collections preserved in alcohol, by water-color representations, and by fruits and seeds.

Recent research in Kew's Herbarium Laboratory has suggested a still more detailed method of classifying certain families and genera: by relationships revealed in microscopic study of sections cut from the specimens. Particularly useful in identifying timbers, this inven-



Schematic Palms and Ferns in Jungle Profusion Grow under Glass of the Temperate House
 This is a view of the interior of the Temperate House, showing the large glass structure and the dense collection of tropical plants. The plants are arranged in a way that creates a sense of depth and scale, with some reaching up towards the glass ceiling. The overall effect is one of a lush, controlled environment.

From Kew's uniquely rich source material gathered by generations of collectors, the taxonomists prepare the great guides and compendiums of plant names and relationships which are Britain's monumental contribution to botanic knowledge.

Since 1841, when Sir William Hooker became Director, the plates and text for the *Botanical Magazine* have been prepared at Kew. This is probably the oldest botanical periodical of its kind still in continuous publication, for it was launched in 1787 by William Curtis, noted botanist of the Chelsea Physic Garden.

A Heritage of Charles Darwin

Made possible through a gift of Charles Darwin, the *Index Kewensis*, listing the names of all seed-bearing plants and the place of their first publication mention, was prepared at Kew and published in 1895. Every five years since then a supplement has brought up to date the knowledge added to the Herbarium's files.

From Kew's never dry well of information also have come the *Floras*, which aim to systematize the plant identification for Commonwealth and Empire areas. These are exhaustive dictionaries. The *Flora of Tropical Africa* alone requires ten volumes to synopsize (more may be added), with another two volumes for the *Flora of West Tropical Africa*, and seven more volumes for *Flora Capensis*, or the Cape area. A new *Flora* is now in preparation at Kew for British East Africa.

The magnificent goal of the *Floras*—that anyone acquainted with the English language may, by these books, identify any plant found wild on Commonwealth soil—is near to achievement. Britain itself, the West Indies, Hong Kong, Australia, New Zealand, former British India, Mauritius, and the Seychelles have now been covered, in addition to Africa.

As Sir John Burrows, with a flourish, says: "No effective record can be put on record of plants unless they can be accurately named."

Kew is their fingerprint file.

Most beautiful of all the treasures in Kew's Library are centuries-old flower paintings done by artists almost unknown outside this special field. Their accurate transfer to parchment of the colors and forms of flower specimens is a unique example of craftsmanship combining art with scientific training.

In the first rank of these botanical artists was Franz Andreas Bauer, an Austrian who settled at Kew in 1790 to paint flowers for George III. This plant-portrait master is buried in St. Anne's churchyard on Kew Green

side by side with masters of human portraiture Johann Zoffany and Thomas Gainsborough. His brother Ferdinand was also a botanical artist (page 490).

If natural-color photography with permanent dyes could be perfected, botanists would have a new tool for plant identification, and the Herbarium's files, holding their mirror up to Nature, would doubtless include photographic plates and slides as well as the pressed specimens and water-color drawings.

Kew aims to assemble in one place the largest, most representative, and most efficiently indexed plant-identification material the world has yet seen.

Rolling Stones Out to Gather Moss

A special feature of Kew's Library is travel books, collected here because of their valuable references to plant ecology.

Trained to keep their eyes open, peripatetic botanists have been excellent travel reporters. Who has ever surpassed, for instance, the descriptive powers of John and William Bartram, father and son, the 18th-century Philadelphia gardeners who explored the fringes of the American Colonies? European writers from Wordsworth and Coleridge to Chateaubriand dipped deeply into William Bartram's *Journals* for their stores of wonder.

John Bartram, as King's botanist, was one of our first New World explorers who brought seeds back to His Majesty's superintendent of Kew Gardens. John alone introducing probably 200 new plants to English cultivators. Some of Britain's best-known garden flowers of today descend from these 18th-century colonists in reverse who brought back to the mother country the image of Pennsylvania hills or southern savanna.

Gardener-statesman Thomas Jefferson visited Kew on his trip to Britain; and Kew remembers his Lewis and Clark Expedition in the plant genera named *Clarkia* and *Leavenworthia*.

Kew's English landscape style, described by a late director as "suave and ample," is the last rose of the Georgian summer. Kew remains in many respects as George III left it.

Sir William Chambers, Kew's royal architect, would not have a day with landmarks he began constructing in the middle 1700's: the 163-foot Pagoda (page 300), still without a crack in its ten stories; the little Greek temples scattered about the Gardens; and the superb classic Orangery.

The Queen's Cottage, which George III's consort Charlotte used as a summer tea-house, is intact, knee-deep in beds of bluebells beneath its dusky yellow roof thatch.



Beauty and Scientific Interest Vie for Attention in London's Japenese Wonderland

Key attractions in the new Japanese Garden include the 100-year-old Tsubaki-no-oka, a large pond with a view of the garden, and a large Japanese garden with a view of the garden.



10. The old Palace, at the foot of the Great Mosque, in the city of Fez, Morocco. The building is a fine example of the architecture of the 13th century. The dome is made of brick and is covered with tiles. The building is surrounded by a low wall and a paved area. In the foreground, there are several small, colorful objects, possibly flowers or decorations, arranged in a row. The background shows a clear sky and some distant structures.


$$= \frac{1}{\sqrt{\pi}} \int_{-\infty}^{\infty} e^{-k^2 x^2} dk = \frac{1}{\sqrt{\pi}}$$

The first step in the process of creating a new product is to identify a market need. This is often done through market research, which can involve surveys, focus groups, and other methods of gathering information from potential customers. Once a market need has been identified, the next step is to develop a concept for the product. This involves brainstorming ideas and creating a rough sketch of the product. The third step is to create a prototype, which is a small-scale model of the product that can be used to test the concept and gather feedback from potential customers. Finally, the product is developed and manufactured, and then marketed to the target audience.

2. Miniature Library

[illegible]

11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1041 1042 1043 1044





Flowers of All Seasons Spread Their Brilliance in the Ever-sparkling Conservatory

The Conservatory was the first of its kind in the city, and it was the first of its kind in the world. It was the first of its kind in the world, and it was the first of its kind in the world.



✧ First with Pens — Then with Needles,
Embroidery Students Copy Nature

Known as the "Embroidery Studio," the room in the basement of the school is a place where the girls of the school learn to copy nature with their needles and threads. The room is a small, cozy place with a table and chairs. The girls are sitting at the table, working on their embroidery projects. The room is decorated with various plants and flowers, creating a natural and peaceful atmosphere.

✧ An Apprentice Gardener Bends To
Among Dark Red Willflowers

Just as the sun is setting, a young girl is seen bending over a garden bed. She is wearing a dark dress and is focused on her work. The garden bed is filled with dark red willflowers, which are in full bloom. The girl is carefully tending to the plants, possibly weeding or watering them. The scene is peaceful and shows the girl's dedication to her gardening hobby.





What could be lower than to leave the City of New York and stroll beneath the Liberty Tree for a day?





* New Students Inspect Types of Plants as Part of Their Learning Course

Two new students, Fred and John, are taking a course in botany. As part of their learning, they are visiting the school garden to see the various types of plants that are growing there. They are looking at a large potted plant with yellow and green leaves and small purple flowers.

ψ The Library Treasures 50,000 Books, Many of Them Priceless

The school library is a treasure trove of knowledge. It contains 50,000 books, many of which are priceless. The books are arranged in rows on shelves, and students can find everything they need for their studies. The library is a place where students can learn and grow.





A Busted Butterfly Hummer's Hint: the Lesson "Grow Your Own Greens"

Learn how to grow your own greens in just a few days. This is a great way to get your family started on a healthy diet. You can grow a variety of greens, including spinach, kale, and Swiss chard. The best part is that you can grow them in just a few days. This is a great way to get your family started on a healthy diet. You can grow a variety of greens, including spinach, kale, and Swiss chard. The best part is that you can grow them in just a few days.



The Entrance of the Museum, from the Square, London, 1850, from the

Illustrations of the Museum, from the Square, London, 1850, from the



Joseph's Beauty Is Only Skin-deep *Lucy H. Starks*

The young man
 who had been called
 the most beautiful
 in the land was
 named Joseph. He
 was a young man
 of great beauty
 and was loved by
 all the women
 of the land. He
 was a young man
 of great beauty
 and was loved by
 all the women
 of the land. He
 was a young man
 of great beauty
 and was loved by
 all the women
 of the land.

Joseph's Beauty Is Only Skin-deep

A young man
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 of great beauty
 and was loved by
 all the women
 of the land.

The young man
 who had been called
 the most beautiful
 in the land was
 named Joseph.





* A Rare Hybrid Is Featured in Queen's Garden of the Royal Gardens

The Queen's Garden of the Royal Gardens is a beautiful garden in the heart of the city. It is a rare hybrid of the Queen's Garden and the Royal Gardens. The garden is a beautiful garden in the heart of the city. It is a rare hybrid of the Queen's Garden and the Royal Gardens. The garden is a beautiful garden in the heart of the city. It is a rare hybrid of the Queen's Garden and the Royal Gardens.

* Queen III Celebrates Gerbera Plants: Birds of a Feather Fly Together

Queen III celebrated the Gerbera plants in the garden. The garden is a beautiful garden in the heart of the city. It is a rare hybrid of the Queen's Garden and the Royal Gardens. The garden is a beautiful garden in the heart of the city. It is a rare hybrid of the Queen's Garden and the Royal Gardens.





When Blooming Tulips Sprinkle the Gardens with Color, the Town knows its Spring, the Road Wagon will be irresistible

at the end of the road, and the town knows its Spring, the Road Wagon will be irresistible. The town knows its Spring, the Road Wagon will be irresistible. The town knows its Spring, the Road Wagon will be irresistible.

Fig. 1. View of the forest of oak and larch trees in the Moscow Garden

1. View of the forest of oak and larch trees in the Moscow Garden





* A Few Museum's Glass and Resin Resemble Canines in a Store Window

For a moment, the woman's hands were raised, and she was looking at the camera. She was smiling and gesturing with her hands. The table in front of her was covered with a dark cloth and displayed several glass and resin craft projects. There were two large, dark-colored vases filled with red and orange flowers. In front of the vases were several small, round plates and bowls, some containing colorful liquids or powders. The background was a plain, light-colored wall.

* Iris Petals Turn to Gold, Blue, Red, and Green in the Chemist's Blender

A woman with dark hair, wearing a blue dress with white polka dots, stands on the left side of the frame. She is smiling and gesturing with her hands towards a table in front of her. The table is covered with a dark cloth and displays several glass and resin craft projects. There are two large, dark-colored vases filled with red and orange flowers. In front of the vases are several small, round plates and bowls, some containing colorful liquids or powders. The background is a plain, light-colored wall.



Around it are the beech, chestnut, and oak woodlands where the birds sing.

Kew epitomizes even more than the history of English gardening. Outside London, few spots have seen so much of Britain's storied past as this riverside curve between Kew and Richmond Bridges.

Julius Caesar's columns may have forded the Thames here in 54 B. C. In Syon House, viewing a vista across the river from Kew, Henry VIII imprisoned Catherine Howard, and from Syon House Lady Jane Grey was carried by barge down to the Tower of London to be for nine days a queen before she died on Mary's scaffold.

Where Queen Elizabeth Walked

From the near-by Palace of Richmond, Queen Elizabeth liked to walk along the river path by Kew to the lawn marked now by the hulk-wed stump of a giant elm which was most probably her contemporary.

The present "Dutch House," or Kew Palace, in Kew, with the date 1631 showing over the door, then belonged to the estate of Lord Henry Capel, which John Evelyn described as having the "choicest fruit of any plantation in England." Surely they lorded over his royal parents' residence at Richmond Lodge, Frederick, Prince of Wales, son of George II, obtained a lease of the grounds from the Capel family in 1730.

The remarkable woman who conceived of Kew as a place where botanically interesting plants would be grown for the sake of the plants was Princess Augusta, Frederick's consort and mother of George III. In 1759, the same year the British Museum opened, Augusta started her living collections here on about nine acres of what is now the northeast corner of the Gardens.

Augusta's scientific adviser was the third Earl of Bute, who majored in botany while minoring in the relatively less important subject of court politics. Her head gardener, William Allen, had been trained in Chelsea's royal garden belonging to the Apothecaries' Society.

The Reverend Stephen Hales, a founder of experimental physiology, designed the flues at the tank-heated greenhouse whose location is marked now by a giant wisteria.

Sir William Chambers, her architect, summed up in 1765 the miracle each man had wrought in Augusta's little garden:

"The gardens of Kew are not very large. Nor is their situation by any means advantageous: as it is low, and commands no prospects. Originally the ground was one cultivated dead flat: the soil was in general

barren, and without either wood or water. With so many disadvantages it was not easy to produce anything even tolerable in gardening; but princely munificence, guided by a director, equally skilled in cultivating the earth, and in the politer arts, overcame all difficulties. What was once a Desert is now an Eden."

The impress made by Augusta and her son George III on Kew still shows.

Kew Green is almost pure Georgian in tone, from the grassy cricket pitch standing out against the backdrop of St. Anne's Church to the onetime homes of royalty which fringe the green like a sunflower's petals.

George III's seven sons made almost a cricket team by themselves, his 13 living children requiring all the houses around the green for shelter.

Summering at Kew, Their Majesties rose at 6; and at 8 a procession of royal dukes from the respective houses converged to pay filial respects. Once a week, George and Charlotte, "attended by the whole offspring in pairs," walked around the Gardens "admiring the works of Nature" and being admired in turn by the royal guests.

George III's Taste for Science

George III's taste for science made Kew—while still a private garden, albeit a royal one—a link which bound the tiny island of Britain to naturalists around the world.

Advised by Sir Joseph Banks (42 years a president of the Royal Society and circumnavigator of the globe on Captain Cook's first voyage*), His Majesty started similar botanic gardens in many of the colonies and sent out Kew-trained men to superintend them. Banks made Kew a depot for colonial interchange of plants.

And what swarms of seed!

There was the Scot Francis Masson, Kew's first plant collector, who explored South Africa and then the Atlantic islands through the French wars. He was taken prisoner twice by French privateers, and finally succumbed to a Canadian winter while still collecting' (Page 495).

And gardener David Nelson, accompanying Cook on his third voyage, and in 1787 sailing on Captain Bligh's *Bounty* with the mission of introducing breadfruit from the South Seas to the West Indies. Nelson lasted 3,600 miles of the voyage in Bligh's loyal but overburdened little launch before he perished on Timor.

* See "The Columbian of the Pacific (Cook)," by J. R. Hildebrand, NATIONAL GEOGRAPHIC MAGAZINE, January, 1937.



Leafy Avenues Converge on the Pagoda

At the foot of the St. Andrew's Church built the Chinese garden, the Pagoda Avenue. The garden is a beautiful one, with many trees and flowers. The pagoda is a very old one, and is a very fine specimen of Chinese architecture. It is a very good example of the kind of building that the Chinese people have been able to produce.

Charles John Smith kept the plant collection alive through Kew's "winter of discontent" following George III's and Joseph Banks's deaths in 1820 and the gardens were taken over by the nation in 1831.¹⁰

Some of the scientists remain to be the specimens in Darwin's record.

Hooker's Character

Hooker and Darwin were friends who succeeded together as botanists at Kew in 1840, with Joseph Dalton Hooker.

He was a man of many parts. At 18, he was a man of 22 by sailing to the Antarctic with Sir James Clark Ross on the *Academy of Terra* expedition. The time of 1841, while the two ships lay together in the ice, Hooker sailed to the Antarctic to join and to help cheer his companions.

In 1843 he was a student in the office of the botanist John Lindley, who was a student of the botanist Nicholas. Lindley and Hooker were of the Hooker's, and he was a student of the Hooker's, and he was a student of the Hooker's.

Charles Darwin, his lifelong friend, wrote Hooker in 1862: "For long years I have looked up to you as the man whose opinion I have valued more on any scientific subject than anyone else in the world."

Hooker's encyclopedic knowledge of plant geography was the trellis against which Darwin shaped his theory of the origin of species.

In 1873, at the invitation of the United States Geological and Geographical Survey of the Territories, Hooker started and reported on the botany of the mountain regions of Colorado and Utah.

Portmanteau Greenhouses

One of the earlier botanists to return to the United States had been a student of the botanist Joseph Dalton Hooker, who was a student of the botanist Joseph Dalton Hooker, who was a student of the botanist Joseph Dalton Hooker.

¹⁰ See "Time and Tide Wait for No Man."

¹¹ See the report, *Natural History of the Mountains of the Pacific*, February, 1841.

¹² See, in the *Natural History of the Mountains of the Pacific*, New York, 1841, the *Portmanteau Greenhouse*, by Joseph Dalton Hooker, and the *Portmanteau Greenhouse*, by Joseph Dalton Hooker, and the *Portmanteau Greenhouse*, by Joseph Dalton Hooker, and the *Portmanteau Greenhouse*, by Joseph Dalton Hooker.

He wrote 'not enough'
his well-loved Gar-

I had represented
several London
theatres. After
that, a portrait
of Admiral Bingley
Ward, I had been
employed in the
service of the
theatres. I had
been in the
service of the
theatres.

The Washington Post says that the FBI is "conducting a preliminary investigation" of the case, which "may require further review." The FBI is "not yet ready to say whether the case is being handled as a criminal matter," the Post says.

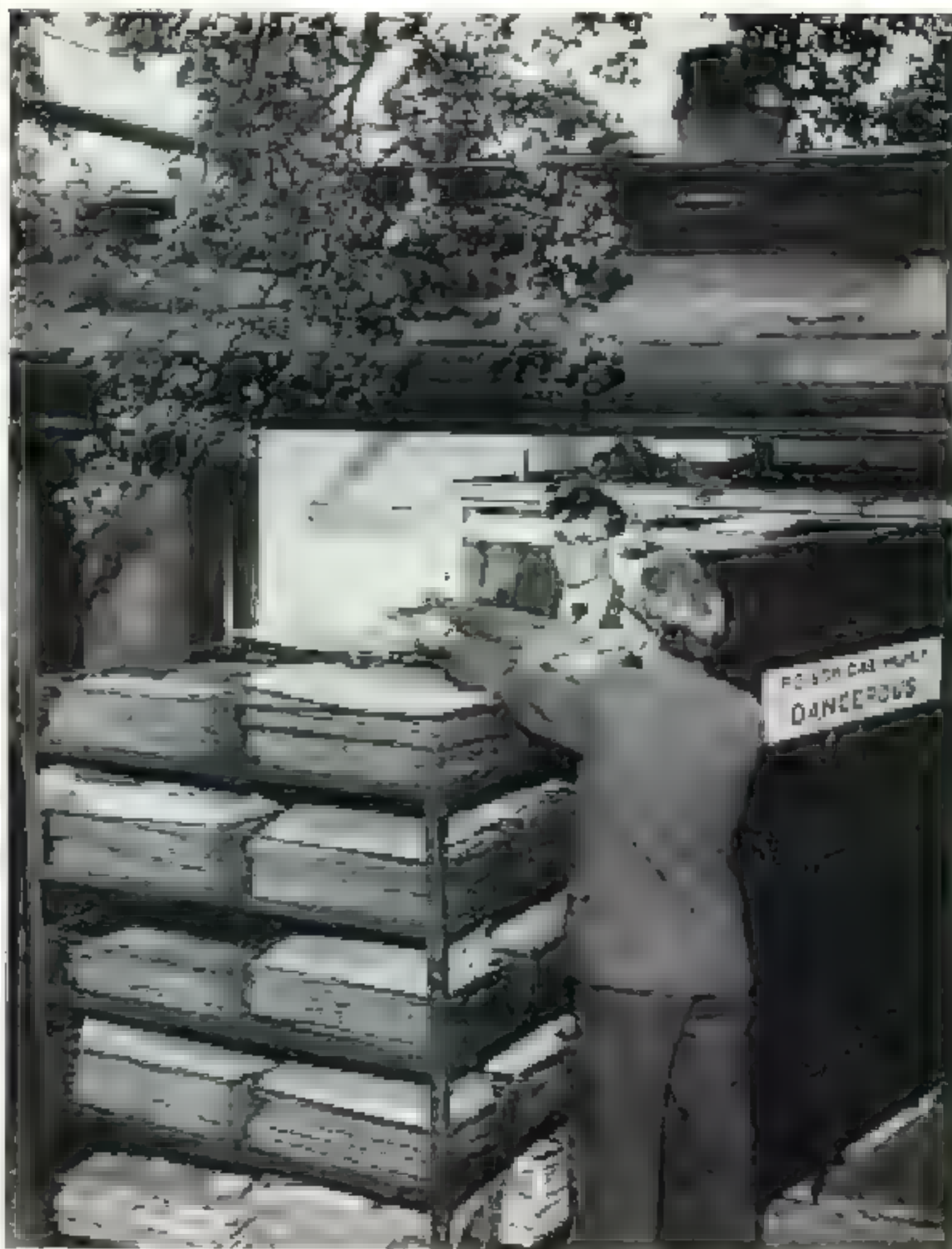
Admittedly, much of the work of 1961-1962 was not done. Though I have returned to the music world of Seattle, in the summer of 1963, I had started the efforts of a symphony orchestra, and perhaps filled with such an ambition connected with a musical festival, we tried to watch the emergence of the old music, and its ones that put in the place of a different kind of music.

He lost interest in the war because he thought it was a waste of money and time. He thought the government was spending too much money on the war and not enough on the people. He thought the war was a waste of money and time. He thought the government was spending too much money on the war and not enough on the people. He thought the war was a waste of money and time. He thought the government was spending too much money on the war and not enough on the people.

Ward, D. L., & L. A. Wilson (1999). The evolution of the human brain. *Journal of Human Evolution*, 37, 100-132.

[illegible]

The results are given in Table 1.



Chemical Warfare Is Still Legal on the Insect Front

[illegible]

...and then condense again on the inside of the vertical pipe and run back down the gutter to the pans.

The Board of Directors, Eastern Airlines Inc., has decided to purchase the aircraft for \$10 million, plus \$1 million in interest on the \$10 million loan. The aircraft will be used for 10 years and then sold for \$2 million. The aircraft will be depreciated over 10 years using the straight-line method.

[illegible]

Voices of the Night

An Explorer with Microphone and Flashlight Finds in Jungle and Roadside Ponds Unexpected Beauty and Interest

BY ARTHUR A. ALLEN

Professor of Ornithology at Cornell University

With Illustrations from Photographs by the Author

THERE is some strange animal that sneaks through the jungle and watches us at work," said Dr. Eyring. "We hear the twigs snapping as it approaches, but it never comes close enough for us to see it."

"Each morning, when we are setting up our instruments, and again off and on during the day we hear it; but we have no idea how large it is. Perhaps it is a jaguar, perhaps only a curious native; but it gives us an eerie feeling to know we are being watched. Possibly you and Dr. Kellogg can identify and record it."

This was exactly the sort of problem that had brought us the invitation to join the Office of Scientific Research and Development project on jungle acoustics, and had taken us to Panama on the first leg of an expedition bound for the South Seas.

The engineers and physicists under Dr. Carl F. Eyring were assigned the job of measuring what happens to sound under all sorts of jungle conditions, and Dr. Paul Kellogg, associate professor of ornithology at Cornell, my son David, and I were responsible for recording and identifying the natural sounds that emanate from the jungle.

Here was our first challenge. For several weeks we had been recording the songs and calls of birds by day and the squeals and whistles and grunts of all kinds of animals at night. Recording bird voices was an old story to us, for we had been doing it in the States for years;* but to sneak through the jungle at night with a flashlight and a microphone was a different experience.

We had come to appreciate how our boys in New Guinea felt when they were entrapped in the jungle and had to listen to the strange sounds which, for aught they knew, were emanating from Japs as often as from animals. Their experiences gave birth to the OSRD project upon which we were engaged.

The next day found us near Madden Field, in Panama, in response to Dr. Eyring's suggestion, where the engineers had cleared a long, narrow strip through the jungle and set up their instruments at either end. Kellogg and I searched the area for animal signs and then sat down to listen.

In half an hour twigs began to crackle, and we could well have imagined an enemy sneaking up on us. I had taken my stand against a tree close to a tiny clearing and then, as the crackling sounds grew louder, I could see a small black and-orange bird flitting from the side of one sapling to another close to the ground across the open space.

Sounds of a Courtship Dance

What Dr. Eyring had heard was the courtship dance of Gould's manakin. The twig-snapping sound was made with the bird's swollen wing quills rubbing against each other as it flitted from one small tree to the next. This curio's performance is described in Frank M. Chapman's book, *Life in an Air Castle*.

Not all of the jungle sounds were so easily identified. Some of the small birds, such as the green shrike vireos, that sang loudly from the lofty canopy of the jungle, though well recorded, remained unidentified for weeks. Some of the night sounds remain unknown to us even today, because we were unable to catch the insects that perpetrated them.

Many of the more satisfactory sounds were made by the tailless amphibians—i.e., frogs, toads, and tree frogs (page 514). They were satisfactory in that they could be tracked down with a flashlight, and the creatures didn't mind continuing their concerts in the beam of the light as it they were captured†.

Even so, there were many surprises, such as the "cave frogs," which sang from little burrows in the mud at the edge of a pond and could not be found even when the flashlight was only inches from them.

One narrow-mouthed toad (*Ptychocheilichthys*) sounded like a large animal in distress; but when we found him calling by a little pool in the jungle, he was scarcely an inch long and round as a marble.

* See, in the NATIONAL GEOGRAPHIC MAGAZINE, "Touring for Birds with Microphone and Cold Camera," June, 1944, and "Hunting with a Microphone the Voices of Vanishing Birds," June, 1947, by Dr. Allen.

† See "A Frog That Eats Bats and Snakes (Speaks Jewish Froel)," by Kenneth W. Vanos, NATIONAL GEOGRAPHIC MAGAZINE, May, 1948.



—L. C. BROWN

Puffed with Song in Canada—Load Sets for a Parkside Portrait by the Author

The Vancouver Island Parkside Lodge, where I was staying, is a beautiful place, and the view from the porch is a most attractive one. The lodge is a fine example of modern architecture, and the grounds are well kept. The lodge is a fine example of modern architecture, and the grounds are well kept.

A sudden squawk, a squawk, a squawk, was followed by a low, continuous hum. The hum was a low, continuous hum, and the squawks were a low, continuous hum.

A sudden hum, a hum, a hum, was followed by a low, continuous hum. The hum was a low, continuous hum, and the hums were a low, continuous hum.

A sudden hum, a hum, a hum, was followed by a low, continuous hum. The hum was a low, continuous hum, and the hums were a low, continuous hum.

to be the best. The best of the National Geographic.

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racket of peepers and toads in northern ponds and to the summer chorus of green frogs and bullfrogs from the lake shores, I was unprepared for the enormity of this southern chorus.

The different species had not awaited the coming of their appointed times as they do in the North, where water temperatures determine which species will perform. The warm April rainbursts had brought them all out at once, and the effect was indescribable.

Returning from a lecture at Collegeboro we heard what we thought to be a flock of lost sheep well within the city. There, in a pasture, was an amazing aggregation of animals, which in the headlights of the car looked like a vast collection of ping-pong balls that momentarily appeared and disappeared.

The blending chorus continued in the flare of the lights, and we soon discovered that the ping-pong balls were the snow-white inflated throats of a host of spadefoot toads (*Scaphiopus holbrooki*). Each inflation lasted only a second or two, during which time the toad emitted a loud blast.

Spadefoot toads are burrowing creatures that spend the day beneath sandy soil and come out at night to feed. Irregularly and only after very heavy rains, all the toads in one locality will be tapping an intermittent pattern which the males start the blending chorus so the females will know where they are expected to lay their eggs.

The eggs are laid in irregular strings and hatch within two days into tadpoles. Within two weeks and before the puddle has time to dry up, these transform into baby toads.

Spadefoots occur locally throughout the Southern States and as far north as Massachusetts, but their activities are unpredictable, since they breed any time, depending on the rains, between March and September.

We spent an interesting week in the vicinity of Collegeboro, with Dr. Malvina Trussell, professor of Biology at Georgia Teachers College, serving as guide. This precaution proved desirable, for whenever we heard an unfamiliar sound we would get out our flashlights and start across fields and fences to find the pond where the creature was singing. On the way back we sometimes found the landowner barring our return with a shotgun.

After locating and identifying the musician, we would drag the microphone, pre-amplifier, and cable to the spot. While Dr. Kellogg in the car adjusted the amplification and the cutting needle, I would hold the microphone within a foot or so of the singer.

After securing a good record of his voice, I would then catch him to make certain of our identification by daylight with the aid of

Wright and Wright's frog book (page 513). This was imperative, for many of these creatures are chameleonlike in their color changes. One familiar with their appearance by day might easily confuse them at night.

Some Frogs Grow Paler When Singing

Many species of frogs are much paler when singing. The green tree frog (*Hyla cinerea*) becomes a golden yellow; the dark brown peeper (*Hyla crucifer*) appears a light tan, and the almost black bullfrog (*Rana catesbeiana*) may look like a blob of bronze putty as he lies inflated on the surface of the pool (pages 517, 518, and 521).

The brilliant green barking frog (*Hyla arenicolor*) usually changes to a deep tawny brown when he gets ready to sing. During the day he may display a few gold specks on a bright-green background or small, brown doughnut-shaped spots; or he may become entirely olive brown, though not approaching his nocturnal shade (pages 511, 510).

In addition to the vocal notes which are so conspicuous a part of the performance, the whole body is inflated during the song, so that a normally slender frog may appear almost spherical (page 514).

My first introduction to the squirrel tree frog (*Hyla squirella*) was at night near Gainesville, Florida. Attracted by a duck-like quacking, I waded along the edge of a pond with my flashlight swinging in the direction of the sound. Finally the beam reflected from a large grayish-white bubble, behind which was an almost circular brownish body about an inch in diameter (page 517).

The next morning the jar in which I had put the curious apparition contained a beautifully slender, brilliant green tree frog, so different from the one I had captured the night before that I could hardly believe my eyes.

This tree frog derives its name from its habit of climbing into trees after the breeding season, where at the approach of rain a number of them often call in chorus. Then they sound more like barking gray squirrels than like quacking ducks.

A similar chorus of the bird-voiced tree frog (*Hyla avipoca*, page 518) may start off like a distant pileated woodpecker; but as other individuals join in, the sound travels through the southern forest in great waves, ebbing and flowing and confusing the listener as to its identity and whereabouts.

Such a chorus we recorded on Indian Island, Georgia, without seeing the musicians or knowing where they were hiding.

Many tree frogs have special places where they spend the day, though they may travel



A Barking Frog Adds His Volume to Cornell University's "Library of Natural Sounds"

[illegible]

On the 15th of April 1921, the above-named Board of Directors of the University of Toronto, in a meeting held at the University House, Toronto, Ontario, Canada, passed the following resolution: "Resolved, that the University of Toronto, in its capacity as a corporation, do hereby certify that the above-named Board of Directors, on the 15th of April 1921, did in fact pass the above-specified resolutions, for and to the effect therein contained, and did so lawfully and legally."

Cook Team Worked Like Tapestry

It is important to understand the general nature of the coverage in order to better understand what is at stake with little or no coverage for small businesses. As a starting point, we present a summary of the coverage.

[illegible]

The first morning it was raining, and we could hear only the dull, steady rain coming out of the sky. After a few days, however, the sun came out for the first time, and the weather was just what we needed.



Spread-leg Hopper Sticks in a Mexican Tree Frog's Gape

Photo by the author. The frog was collected by the author in the state of Oaxaca, Mexico. The stick bug was collected by the author in the state of Oaxaca, Mexico. The frog was collected by the author in the state of Oaxaca, Mexico. The stick bug was collected by the author in the state of Oaxaca, Mexico.

upon one of the "bushy" frogs—a shallow puddle in the pine woods was a lively enormous sausagelike vocal sac protruding from his throat to far above his head.

The chkklike peeping call was so out of proportion to the size of the music box and so different from other amphibian sounds that at first we thought something must have punctured the little creature's sounding board. Dozens of others, however, sang exactly the same way.

While we were recording this oak toad, there were several other species singing near by, and we rejoiced to have a quiet spot where few cars passed. But we had scarcely begun to

on another species before a long line of cars went by, heading for a dull glow down the back road. Soon the juke box was going and we realized we had selected the wrong roadhouse for our evening's work.

On our way north from this Georgia expedition, we stopped one night near Pinehurst, North Carolina, when we heard a curious nasal chuckling from a wooded hill. Following it, we discovered a swampy pond at the edge of the woods where there were eight or ten large green tree frogs riding valse to the chorus we had heard from the road.

Occasionally a male would ask his call to the ensemble—a great improvement on the solo forecasts that explained that softening rather than attractive recordings. I thought we were recording the green tree frog (page 515), although there was a certain doubt as to the measure that seemed unfamiliar.

In the beam of the flashlight I did not notice the *Larrea* or *Yucca* below the water on the side of the pond.

Not until three days later, when showing the specimen to a frog-loving friend, was my attention called to the stripe, and we realized that we had recorded the much rarer Anderson's tree frog (*Hyla andersonii*), the very one we heard at the time we arrived in the New Jersey pine barrens hoping to find it.

The Anderson is found from New Jersey to North Carolina. Associated with it is another amphibian, the carpenter frog (*Rana sylvatica*, page 515). It is found in all the similar places where the Anderson is found, and it is not uncommon to find the carpenter frog in a swampy spot where the Anderson is not found. It sings on a rather side of the tree.

giving the strange appearance of a frog with water wings.

A still more human touch rewarded us in New Jersey when we recorded the pickerel frog (*Rana palustris*, page 522). This species is not unusual in appearance, but when it calls it reverberates like that sleeping neighbor in a Polman.

Toads Frode a Milky Poison

We might just as well have recorded this frog's snores at home or in any cool pond east of the Rocky Mountains. It resembles a small brown meadow frog, but it is yellow under the legs. Its skin secretes a substance that is poisonous to other frogs, so that they cannot be kept together in close confinement.

Toads also, when annoyed, exude a milky substance from the glandular swellings on their skins. Dogs and other enemies usually leave them alone, although snakes are not so particular. These truly beneficial little animals are supposed to produce warts on the fingers of children who handle them. How this tale originated no one seems to know. One should be careful, however, not to rub one's eyes after handling toads, for even a trace of the secretion will cause eyes to smart.

By the end of the summer we had recorded satisfactorily the calls of 20 of the frogs, toads, and tree frogs of eastern United States, and felt ready to publish an album of records devoted entirely to the tailless amphibia as a companion volume to that of the American bird songs.

We had been so intent on making sure of our identifications that we had captured the actual frog whose voice we had recorded, and this had precluded taking action photographs of them singing. The photographic record, therefore, had to wait for another spring.

Years ago it had been my privilege to assist Dr. and Mrs. Albert Hazen Wright in flash-lighting these interesting creatures for some of the illustrations in their *Handbook of Frogs and Toads of the United States and Canada*, a third and greatly enlarged edition of which has recently come out. That was in the days of flash powder and slow black-and-white film.

Now, with flash bulbs and color film, the results are more satisfying, although the procedure is much the same. One locates his quarry as we did for the recording.

Most species are not very timid when singing, and if one works rapidly he may be able to get focused and flash the bulb while the air sac is still inflated. More often, however, one focuses on the deflated frog or toad and then waits in the dark for him to call again before flashing the bulb.

It is a help to have an associate to hold the light on the frog while focusing. Sometimes the frog jumps forward when he calls, just enough to be out of focus on the processed film. Or perhaps his air sac may be so large as to extend out of the plane of focus, though the frog himself be perfectly sharp.

Perhaps, too, the creature will refuse to sing as long as the camera is pointed at him. This happens often on moonlight nights, when the frog can perhaps see the camera and mistake it for a night heron.

Stalking the Bullfrog

The bullfrog (*Rana catesbeiana*) is probably the best known of all the tailless amphibians, both for its sonorous voice and for the epicurean delicacy of its hind legs (page 521); yet it gave me more trouble than any of the others. Time and again I tried to stalk one—in Florida, Georgia, North Carolina, New Jersey, and in New York; but every one was so timid that it would not permit approach.

Finally, in a beaver pond near Ithaca, New York, we discovered that with a canoe we could get within photographic range (five feet) of the thundering amphibian.

These particular bullfrogs were calling from the open water of the beaver pond, where beds of water plants came nearly to the surface. Their large eyes glowed in the beam of the flashlight, so that they were easy to find.

When only their heads protruded, they showed green with yellow throats, and their bodies were very dark. This indicated that they were not ready to sing, for the preamble to song is to inflate the body, which causes it to float on the surface. It then changes from nearly black to a dull, puffy color.

If alarmed when floating, this frog gives a sudden synchronous grunt and jump, which automatically deflates it so that the jump ends in a dive something like the old swimming hole "belly flop."

These exasperating performers sang so infrequently, however, that it was impossible to hold the canoe and tripod in exactly the same place for one to five minutes between calls.

Finally we found a fairly friendly frog in about two feet of water, where I could sit in the canoe while my wife and son, Glen, held it steady. Then, without disturbing the crooner, I could set the tripod in the water where the distance from the lens to the subject would not change even if the canoe drifted.

The principal difficulty with this setup was that the camera was so close to the water that there was not sufficient angle to show off the vocal sacs to advantage.

The eyes of frogs protrude like the head-

lights of a car, but when touched they so immediately retreated. I wondered if this protective measure might be of use to them when diving, but they traveled so fast that my eye could not discern what happened.

Therefore, with the aid of several Cornell friends I arranged a series of snapshots of frogs jumping, using the speed flash at 1/5000 of a second.*

We had difficulty getting the frogs to jump in the plane of focus, but eventually secured a few satisfactory snaps of the ordinary garden variety of jump, where the eyes are kept open and the arms and legs left extended in normal pose. We also snapped the high dive, in which the frog closes his eyelids, shuts his nostrils, folds his arms back against his body in a very streamlined manner, and hits the water with his nose (page 510).

Sometimes a frog attempted to jump so high that he lost his momentum before completing the jump. Then, instead of landing front feet first or all four feet together, the hind legs dropped, and during the fraction of a second when the flash made the picture he appeared to be duncing on his hind toe.

There are some 2,000 species of tailless amphibians in the world, belonging to 14 families. The largest number of species occur in the New World Tropics, but eight families and 99 species and subspecies have been described from the United States and Canada†.

The three familiar groups in the United States and Canada are the frogs, the toads, and the tree frogs or tree toads, as some of them are called. There are a number of structural differences separating these three families, but, in general, frogs have smooth, moist skins and toads dry, warty skins.

Tree Frogs Equipped with Suction Pads

Tree frogs resemble toe frogs in their moist skins, but they have suction pads on their fingers and toes, which enable them to cling to vertical surfaces. Indeed, the southern green tree frog is known to jump from near-by vegetation onto lighted windowpanes for insects attracted there by the light (page 515).

Most of these amphibians are more active at night than during the day, though during the height of the breeding season many species call irregularly all day. Indeed, peepers (*Hyla crucifer*), cricket frogs (*Acris gryllus*), and swamp crickets (*Pseudacris nigrita*) when undisturbed sing nearly as continuously by day as by night. They are much less timid and much more easily observed, however, with a flashlight at night.

North American frogs and toads vary in size from the female bullfrogs, whose bodies may

be 10 inches long and may weigh 3½ pounds, to the tiny swamp cricket, or little chorus frog (*Pseudacris nuttallii*), the males of which are the smallest vertebrate animals in North America, scarcely one-half inch long even when grown (page 521).

Most of these little creatures are insectivorous, but bullfrogs have been known to catch birds, to eat other frogs, and even to swallow snakes and alligators longer than themselves.

In most species the females are larger than the males, owing perhaps to the large number of eggs they carry. They are not equipped with the vocal sacs of the males and are usually silent. Some, like the common toads, have a limited variety of chirping notes apparently to help in sex recognition.

Many male tailless amphibians have secondary sexual characteristics, such as the swollen thumbs of the meadow frogs or the enlarged ear drum of the male green frog (page 520). Male bullfrogs and green frogs have yellow throats, while those of the females are white; and the vocal sacs of toads and tree toads, when not inflated, register darker areas than the corresponding parts of the females.

The vocal sacs are inflated through a narrow slit or two slits in the floor of the mouth. They serve only as sounding boards, to give resonance to the calls produced by the air driven back and forth from the lungs to the mouth past rather simple vocal cords.

If the little animal sings with its throat only partly inflated, which seldom happens, the sound produced has a different quality. When singing or croaking the frog's mouth is kept tightly closed.

Only under the stress of great fear, as when captured by a snake, is the mouth opened, and then the resulting cry is a scream different from the normal call.

People are becoming much more sound-conscious, and many of us are distressed to hear western meadowlarks singing in movies purported to have been made in New York State, or California when this singing near Lake Champlain.

Perhaps someday we shall be just as particular about our night sounds. We shall not have frogs croaking with their mouths open, or western toads singing east of the Mississippi. Indeed, I visualize the time when the majority of us will arrive along the road on a spring night and recognize the authors of songs that rise from roadside ponds as readily as the voices of radio crooners.

* See "New Light Down on Bird Photography,"

NATIONAL GEOGRAPHIC, June, 1948.

† See "Our Friend the Frog" by Doris M. Cochran, NATIONAL GEOGRAPHIC MAGAZINE, May, 1942.



Marshalling Pig Western Toad Balloons His Vocal Sac and Shows a Mottled-Lime Blot

This toad is one of the largest and most common of the group, and is found in the Great Basin. A very common toad in the Pacific Northwest. A small toad of the same species is found in the mountains of the Pacific Northwest. A toad of the same species is found in the mountains of the Pacific Northwest. A toad of the same species is found in the mountains of the Pacific Northwest.



Toude Whistly Like Birds, Peep Like Chicks, or Trill Softly

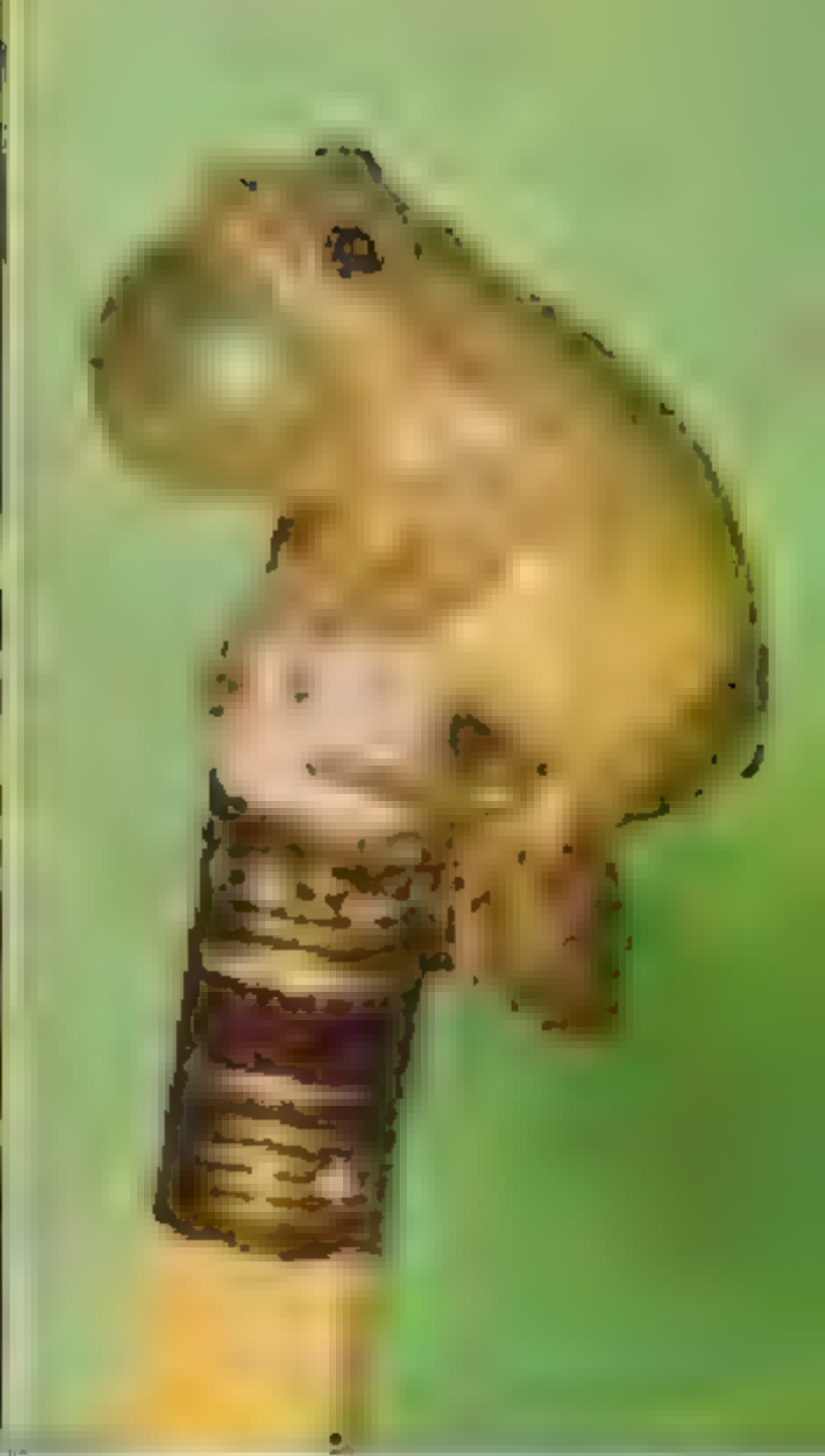
The bird is a small, brown, and white, with a long, thin, and slightly curved beak. It is perched on a thin, light-colored branch, and its body is angled towards the right. The background is a soft, out-of-focus green, suggesting a natural, outdoor setting.

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Source: [illegible]

Source: [illegible]



* Camouflage Protects a Singing Tree Frog; Spring Peepers Toads Unleashed on a Pencil

Camouflage is a key survival strategy for many animals. The white tree frog, for example, uses its white color to blend in with the bark of trees. The spring peeper toad, on the other hand, is known for its loud, high-pitched call. A pencil is a common tool used in the field to observe and record the behavior of these animals. A study of the white tree frog and the spring peeper toad was conducted in a forest in the state of Georgia.

* The Small Southern Tree Frog Climbs and "Hops" Like a Gray Squirrel

The small southern tree frog is a common sight in the forests of the southern United States. It is known for its ability to climb and hop like a gray squirrel. A study of the small southern tree frog was conducted in a forest in the state of Georgia. The study found that the small southern tree frog is a very agile animal, capable of jumping up to 10 inches in the air.



Unlike the Leopard Barking Tree Frog Can Change His Spots

Scientists have found that the Leopard Barking Tree Frog can change its spots to match its surroundings. The frog's skin is covered in small, dark spots that can disappear or appear at will. This ability helps the frog to hide from its predators.

The frog's skin is also covered in small, light-colored spots that can disappear or appear at will. This ability helps the frog to blend in with its surroundings. The frog's skin is also covered in small, dark spots that can disappear or appear at will. This ability helps the frog to hide from its predators.

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4. A Croaking Green Frog Cries On, Interrupted by Photography

The croaking green frog, *Rana clamitans*, is a common species in the eastern United States. It is a large, robust frog with a green back and a lighter, yellowish-orange throat and chest. The frog is shown in a dense thicket of green leaves and branches, looking directly at the camera with a dark, round eye.

5. A Flash in the Night Catches the Female Staring Wide-eyed at an Intruder

The croaking green frog, *Rana clamitans*, is a common species in the eastern United States. It is a large, robust frog with a green back and a lighter, yellowish-orange throat and chest. The frog is shown in a dense thicket of green leaves and branches, looking directly at the camera with a dark, round eye.





* Like David Before Goliath: A Penny Saved Is Worth Two Pounds Borrowed
Crispin O'Grady Faces a Giant Bullfight

As a result, the open-loop system is stable for the large delay τ and the small gain K . The closed-loop system is stable for the large delay τ and the small gain K if the open-loop system is stable for the large delay τ and the small gain K . The closed-loop system is stable for the large delay τ and the small gain K if the open-loop system is stable for the large delay τ and the small gain K .



* "Jug o' Rum" Body and Throat Initiated,
* "Rolling Home" Wings His Bass Fiddle

1. The first step in the process of developing a new product is to identify a market need. This is often done through market research, which can involve surveys, focus groups, and other methods of gathering information about potential customers. Once a market need has been identified, the next step is to develop a concept for a product that meets that need. This involves brainstorming ideas and selecting the most promising one. The third step is to create a prototype of the product, which allows the developer to test the concept and make any necessary adjustments. Finally, the product is launched into the market, and the developer monitors its performance and makes any necessary adjustments to ensure its success.



Some Aquatic Insects Wear Heads, Swim Suits, and 'Water Wings'

[illegible]

[1] J. K. Hale, *Functional Differential Equations*, Springer-Verlag, New York, 1977.
 [2] J. K. Hale, *Verifying Functional Differential Equations*, Springer-Verlag, New York, 1987.
 [3] J. K. Hale, *Global Bifurcation for Functional Differential Equations*, Springer-Verlag, New York, 1991.
 [4] J. K. Hale, *Global Bifurcation for Functional Differential Equations*, Springer-Verlag, New York, 1991.
 [5] J. K. Hale, *Global Bifurcation for Functional Differential Equations*, Springer-Verlag, New York, 1991.
 [6] J. K. Hale, *Global Bifurcation for Functional Differential Equations*, Springer-Verlag, New York, 1991.
 [7] J. K. Hale, *Global Bifurcation for Functional Differential Equations*, Springer-Verlag, New York, 1991.
 [8] J. K. Hale, *Global Bifurcation for Functional Differential Equations*, Springer-Verlag, New York, 1991.
 [9] J. K. Hale, *Global Bifurcation for Functional Differential Equations*, Springer-Verlag, New York, 1991.
 [10] J. K. Hale, *Global Bifurcation for Functional Differential Equations*, Springer-Verlag, New York, 1991.

[illegible]

Feast Day in Kapingamarangi

By W. ROBERT MOORE

With Illustrations from Photographs by the Author

THERE it is! There's Kapingamarangi." The youthful skipper of our small ship lowered his binoculars and pointed them toward me.

Through them I could distinguish only a hazy line dead ahead on the horizon. But it was our landfall, and I was seeing a hope become fact.

Months before, my interest in Kapingamarangi had been aroused when an officer at the Navy Department in Washington tripped lightly over its musical syllables. Like Kalamazoo or Kealakakua, it was a name I couldn't forget.

Later, in Guam, I learned more about Kapingamarangi from a civil administrator, official in a discussion of the former Japanese mandated islands of the Pacific, over which the United States now has control.

Uncle Sam's Remote Polynesian Words

"Kapingamarangi, you know, is Polynesian," he explained. "The language and customs of the people there and at its nearest neighbor, Nukunono, 200 miles to the north, differ from those in all the other island groups of our Trust Territory. The rest are Micronesian."

"Why Polynesian folk should be on these two isolated atolls, hundreds of miles away from any part of Polynesia, no one knows. But there they are" (map, page 530).

As we talked, a comely Polynesian maid smiled at me over my informant's shoulder from a framed photograph on the wall. Her home was Kapingamarangi.

In Trick I learned that an American steamer ship was due to leave soon on a southern fanning run. It was scheduled to call at Kapingamarangi, nearly 500 miles to the southward, close to the Equator. When it sailed I was aboard.

A few days later I stood on the bridge watching the Kapingamarangi island mass grow and simplify into thick clusters of coconut palms and heavy green breadfruit trees (page 524).

The sun slipped down into the orange-stained sea ward we maneuvered through narrow Greenwich Passage and entered the lagoon. In the short tropic dusk that followed we were afforded only a brief view of the 34 islands which stud the atoll, pear-shaped and seven miles long.

Only a few yellow lights from tiny coconut-oil lamps flickered across the water from two

or three islands near where we anchored in darkness. But our arrival had not gone unheeded!

Numerous outrigger canoes emerged from the blackness and swarmed about our ship. They were slender ruggies, with incurving gunwales and long spidery outriggers, unlike any I had seen in other Pacific islands (page 531).

"There's King David," said one of my shipmates, when a long white canoe swung into the lights of our landing ladder.

Seated amidships in the craft was a bulky figure clad in a khaki shirt and white shorts. Half a dozen bronze-backed paddlers manned the canoe.

Sitting in the bow, overflowing its gunwales, King David looked large. When he clambered aboard he looked even larger, for he is nearly six feet tall and must weigh between 250 and 300 pounds (page 532).

He beamed greetings at everyone on board, and made the rounds to shake hands. Deftly a local trader handled the language exchange, for the chief spoke only a few halting words of English.

Scores of other islanders scrambled aboard and crawled the deck space to see the ship move.

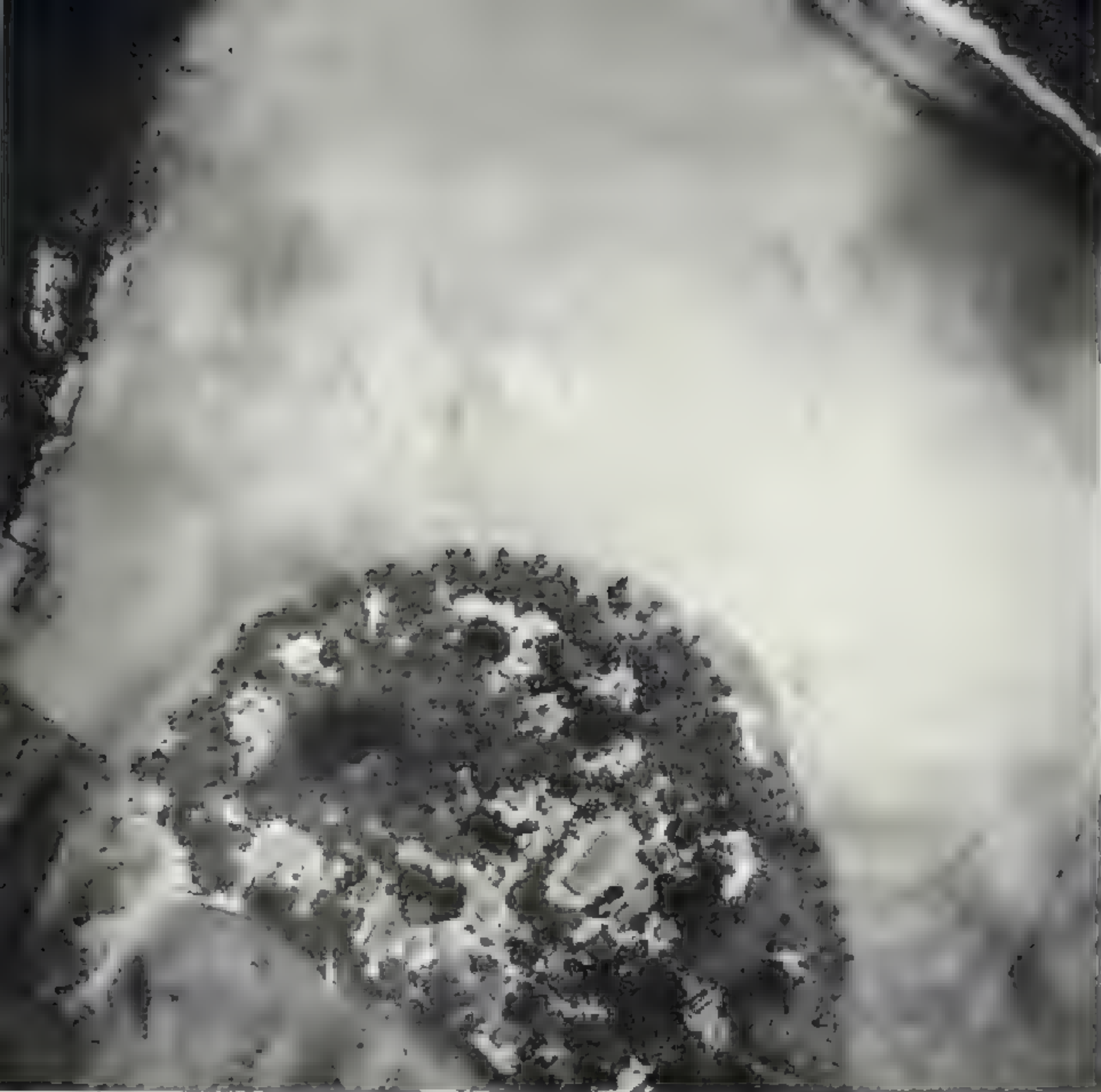
Whenever American vessels halt overnight at any of the Pacific islands, native villagers are eager to get the chance to watch the motion-picture shows.

I spent an interesting hour studying the play of expressions over their intent upturned faces as they watched Joe Palooka get enmeshed with some chysters in a real-estate and park promotion scheme.

Movies over, the people again melted into the darkness. But they had left the pleasant rumor abroad that there was to be an island wedding and feast the next day.

Natives Clustered on Three Islands

Early next morning, when I went ashore in a bobbing outrigger canoe, I found preparations for the feast already under way. Women sat in the shadows of their thatched homes and under the trees busily working at piles of coconuts, breadfruit, and *pureka*, or swamp taro (page 528). Here and there men were cutting more coconuts from the towering trees. Several canoes arrived from other islands laden with supplies (page 533).



As Truly Picked as a City Suburb Is Tiny Lough Island

Most of the people who visit Lough Island, the tiny, rocky island in the middle of the sea, are from the city of Dublin. The island is a suburb of the city, as truly as any suburb can be. It is a suburb of the city, as truly as any suburb can be. It is a suburb of the city, as truly as any suburb can be.

It does not seem long to reach almost every person in the world. The island is a suburb of the city, as truly as any suburb can be. It is a suburb of the city, as truly as any suburb can be. It is a suburb of the city, as truly as any suburb can be.

The tiny island is a suburb of the city, as truly as any suburb can be. It is a suburb of the city, as truly as any suburb can be. It is a suburb of the city, as truly as any suburb can be.

How is it possible that the island, with its tiny waves and tiny waves, can be a suburb of the city, as truly as any suburb can be. It is a suburb of the city, as truly as any suburb can be. It is a suburb of the city, as truly as any suburb can be.

There is the tiny island, as truly as any suburb can be. It is a suburb of the city, as truly as any suburb can be. It is a suburb of the city, as truly as any suburb can be.



Pics. Patterned for the Feast, Are Cut Up for the Island's Tireless Cooker

When the feast is over, the men begin to prepare the food for the next day. The women are busy with the cooking, and the men are busy with the preparation of the food. The feast is a time of great joy and celebration, and the people of Kapingmarangi are proud to share their traditions with the world.



A Wide Spidery Outrigger Keeps This Englike *kayaka* from Upsetting

The outrigger is a traditional Hawaiian canoe, built of light wood, and is used for racing and for carrying cargo. It is a very stable vessel, and is well adapted for use in rough water. The outrigger is a very important part of the Hawaiian canoe, and is used in many different ways. It is a very interesting and useful vessel, and is well adapted for use in rough water.



Stap in the Row: Women Beating Sack Cakes for Dispatch to a Waiting Ship

In the morning I walked on the beach to see the women beating sack cakes for dispatch to a waiting ship. The women were sitting on the ground, beating the cakes with their hands. The cakes were large and round, and the women were wearing traditional clothing.

Through the morning I progressed from watching to working among the women, down at least, and then up to the beach. All women were busy with pieces of sailing cloth. About eight women, I counted, were doing a piece of work, and I saw that they were working hard.

Some of the women were beating the cakes with their hands, while others were using tools. Some were scraping and cleaning gourd roots. The women were working in a row, and the cakes were being prepared for dispatch to a waiting ship.

Still other womenfolk were preparing the coconut. It was a seeded variety, locally called *honi*, from the fact that it had been supplied to the women by the ship on 11th in the Marshalls.

The women were sitting on the ground, beating the cakes with their hands. The cakes were large and round, and the women were wearing traditional clothing. The women were working hard, and the cakes were being prepared for dispatch to a waiting ship.

Kitchen Equipment Sample

The food that was used with the cream and the coconut plant. The women were using tools to prepare the food. The food was being prepared for dispatch to a waiting ship. The women were working hard, and the food was being prepared for dispatch to a waiting ship.

The food was being prepared for dispatch to a waiting ship. The women were working hard, and the food was being prepared for dispatch to a waiting ship. The women were working hard, and the food was being prepared for dispatch to a waiting ship.



What Bread Is to the American Household, Taro Is to These Island Folk.

Housewives go to the kitchen to prepare the food, and the men go to the field to plant the taro. The taro is a root vegetable, and it is used in many ways. It is often boiled and eaten with coconut milk, or it is used in soups and stews. The taro is also used to make bread, which is a staple food in many parts of the Pacific Islands.

in coconut shells, which serve as natural casseroles.

Modern housewives tend to clutter their kitchens with electric pots, glass cooking tables, mechanical mixers, and electric stoves, or they range, would not themselves be glad in the simplicity of the Karungasians' kitchen.

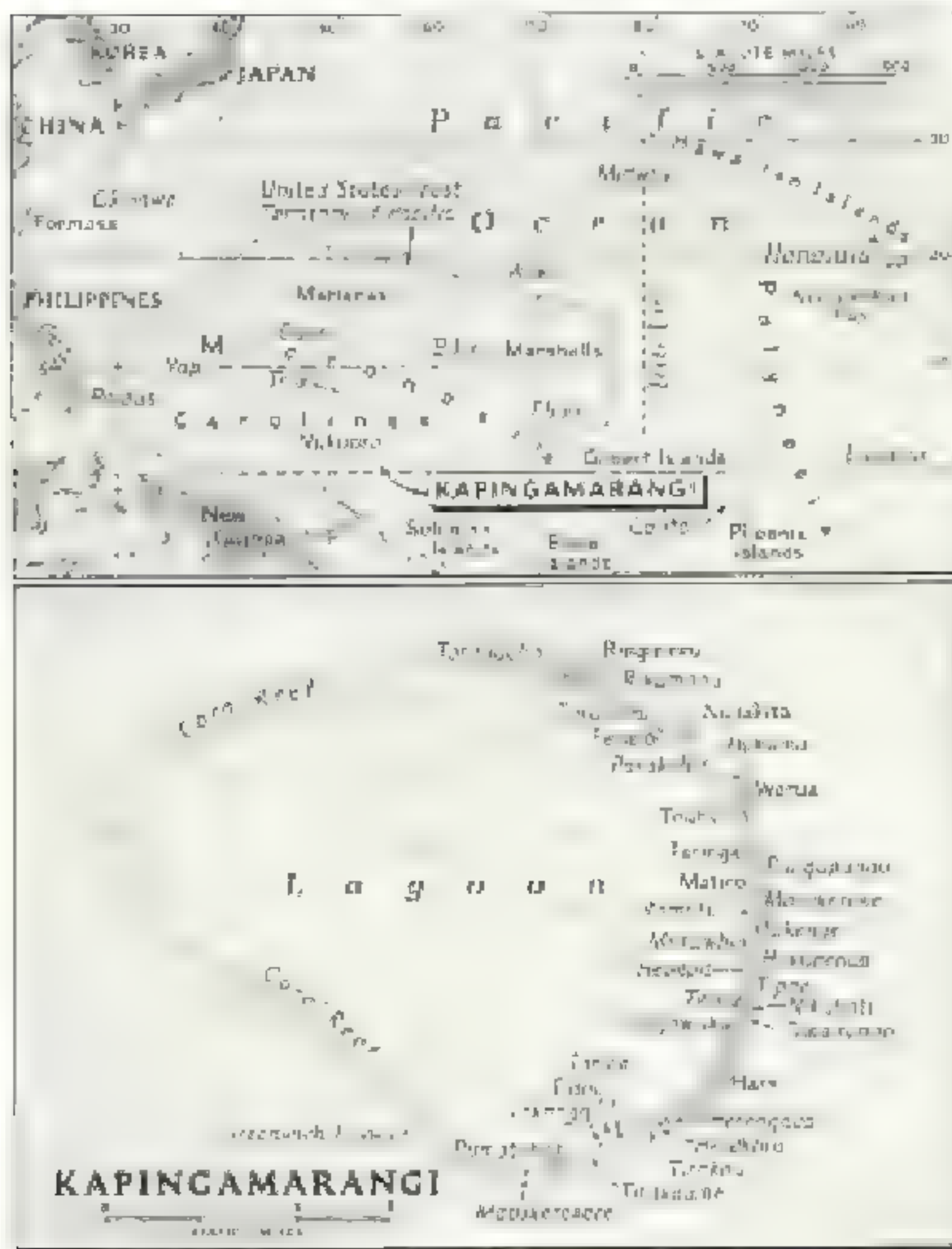
But as often the women keep making stoves for the ground, and it is not a far cry from coconut stoves or other devices. These stoves are built over the fire.

When the food is thoroughly cooked, the food is placed in a bowl and covered with leaves, roots, and a layer of taro. Then,

later, the pit is opened and the fully cooked food is removed, still in heat-sterilized wrappings and shell casseroles.

Housewives have a few imported tools in which to boil food, such as a pot, but for the most part they use only simple wooden bowls, which are made of low, wide, and shallow wood pieces, and a small shell for a lid.

There are several other things in use, but they have been imported from foreigners, or from the mainland. About a year ago I saw an American can that had exploded near the house. I was told it was far superior to any other I had ever seen. I was told it was far



Pear-shaped Kapingamarangi Lies 75 Miles North of the Equator, 200 Miles from Its Nearest Neighbor

Formerly one of the island groups controlled by Japanese warlords, the atoll now is part of the United States Trust Territory of the Pacific. Local Polynesian names for the 34 islands during the war replace those used on Japanese maps. The new spellings are introduced by the Bernice P. Bishop Museum, Honolulu, whose staff recently spent months studying the culture of these people and those of Nukunono to the north. Small ships can enter the lagoon through Greenwath Passage, but visitors must watch for dangerous coral heads.

Other islands in the atoll with still more food. Women and girls dugged basket after basket to the thatched-roof schoolhouse which was to serve as the feast pavilion.

"Dress for Dinner" in Mother Hubbards

When the people were busy at their many duties, they dressed in everyday attire. Most of the women wore simple lava-lavas, or skirt-like bunches; the men were clad in either lava-lavas or trousers.

When they had finished their tasks they

clustered about the shallow wells or went to the lagoon to bathe.

Soon they began appearing in their Sunday best, which for many women meant Mother Hubbards or voluminous long dresses. The men donned shirts with their trousers, and a goodly number even brought out their pocket and cuffs.

An hour before sunset everyone had gathered for the wedding (page 537). Not until I saw the wedding party assemble did I learn that it was to be a double wedding. The young folk were from four of the most honored families on the island.

Bridegroom Samuel I knew. In Tok he had studied first aid and enough simple medicine to take charge of the island dispensary.* That morning he had been clad only in a pair of navy trousers while he was assisting the pharmacist mate from our ship.

Now he appeared self-consciously in a black coat several sizes too small, gray navy trousers, a white shirt and necktie, and a pair of oil combat shoes. The other groom wore a black suit.

The brides were attired in bulky ankle-length gowns, one white, the other gray-green, on which were clusters of colored ribbons. Several bright ribbons decorated their hair.

While the quartet stood uneasily in front of the school pavilion, with the other islanders sitting on the ground round about, King David came forward and delivered a brief talk (page 532). The minister spoke a few words and a blessing.

* See "Pacific Wards of Uncle Sam," by W. Robert Moore, *National Geographic Magazine*, July, 1948.



Outrigger Canoes Swam to Kapiemani's Blue Lagoon When a U. S. Ship Came
The crew of the U. S. S. Albatross, which was sent to the lagoon to investigate the disappearance of the Albatross, was met by a group of natives on the beach. The natives were very friendly and showed the crew to the lagoon.

1) ссылка на сайт
 2) ссылка на файл
 3) ссылка на видео

$\lambda_0 = \frac{1}{\mu} \left(\frac{\partial \mu}{\partial \lambda} \right)_{T,p}$

[illegible]

Kapiti, New Zealand. Visitors Were All Day Long to Prepare Hundreds of Dishes for the Wedding Feast

As the day of the wedding drew near, the number of visitors increased, and the preparations for the feast were completed. The day of the wedding was a day of great rejoicing, and the feast was a most magnificent one. The visitors were all day long preparing hundreds of dishes for the wedding feast.





• Bridegroom Spent Entertaining Villagers
Following His Wedding

Just after the ceremony, the bridegroom spent
the afternoon entertaining the villagers. He
played the guitar and sang songs. The
villagers were very happy to see him.

• Village Youngsters Sit on Mats & Watch
the Ceremony

The young people of the village were
very interested in the ceremony. They
sat on mats and watched the bride and
groom. They were very happy to see
them.



Dr. Peter Buck, Director of the Bishop Museum in Honolulu, who with three anthropologist companions had been studying Kapingamarangi customs for three months, was asked to add a few remarks.

To be married here, the couple need only announce their intentions to the chief. Customarily, they live with the man's parents for a while, then go to the bride's home. Later they are free to establish their own home.

Ceremony over, the islanders queued up to congratulate the newlyweds. Some shook their hands; others rubbed noses in true Polynesian fashion; a few women shed tears.

Wedding Feast Followed by Music

Then came the feast. As honored guests, Dr. Buck and his companions and some of us from the ship sat with the bridal party and relatives at tables under the thatch roof. We ate from plates secured from the Japanese. The rest of the villagers sitting outside ate directly from the leaf-wrapped packages.

I relished every dish and ate until I was thoroughly satisfied. With a few such feasts my girth would rival that of King David, particularly as the foods are mostly starches.

After the feast was finished, I heard the strumming of a guitar near by. I found Samuel sitting in the midst of an admiring group of young folk, plucking tunes on an instrument he had brought from Truk (page 534). He already had shed his formal garb of the wedding, as had many others.

The tropic night settled abruptly over the island. As the Bishop Museum men had a small electric generator and members of the ship's crew had brought the motion-picture projector ashore to treat the islanders to a movie.

For two hours an enthusiastic audience cheered, clapped hands, laughed, and gazed with eager interest as Pluto the Pup and Donald Duck romped across the screen. The Brooklyn Dodgers played baseball, swimmers exhibited funny dives, and Hollywood stars sang.

A film showing the canyons and skyscrapers of New York brought gasps from these folk who had seen nothing larger than thatched canoe sheds and tall tufted palms.

Next day was Sunday. When I came ashore, there was none of the bustle I had seen the day before. King David and most of his people are Christian and believe that no work should be done on Sunday.

Part of the cooking on the previous day had been for the whole week end. The men had halted their work on copra, boatbuilding and sundry tasks. My picture-taking wasn't considered work, so I did not incur disfavor.

Bell announced midmorning church service. As the churchgoers began trooping to the large thatched church, they formed a striking assemblage, dressed in their best as they had been the night before. Many women and young girls arrived, however, with their dresses still folded over their arms. At the doorway they would pause, slip their "new look" gowns over their lava lavas, then go in.

Upon leaving, many women carefully removed their formal garb. Youngsters pulled off their finery and fled.

The island has been Christian only since 1922. Prior to that, it had its traditional priests and a temple.

I talked with gray-whiskered Henry, an elderly native minister from Nakororo, who told me he had fostered the island's change.

"When I came here in 1922," he reminisced, "the temple stood where the church is now. The people had all kinds of tabus.

"That island over there" he said, pointing to adjacent gemlike Taringa, "was all taboo; no one dared stay there overnight.

I told them I would go there and live, to prove their beliefs wrong. I planted coconuts there and made paths. Now look at it! Nothing happened to me and they believe me.

"Afterward we took the temple to the beach and burned it, and built our church."

Only remnant of the past is a big coral slab which stands upright behind the church. It serves as a monument to Uamaturu, supposed discoverer and first chief of the atoll.

When I first came ashore, my attention was centered mainly on the work of the women preparing the feast.

The Men Work, Too!

But the Kapingamarangi men also were busy. They climbed the coconut trees, slaughtered the pigs, and supplied fish and other provender.

Still other men were preparing copra for export (page 527), building canoes, thatching houses, and erecting a new dispensary.

Many tasks are community enterprises. Secondary chiefs who serve under King David do so, for example, when a home needs thatching.

Each village householder is then called upon to furnish a specified number of bundles of thatch. When these arrive, the men fall to and within an hour or so the roofing job is completed.

At the time of my visit a number of men were building a larger dispensary. Oddly enough, the whole roof assembly was almost completed and set in an open space near the beach. Walls still were nonexistent.



All Kapinamarangi Attends the Wedding and Eagerly Wants to Congratulate the Bride.

The bride and groom are seated on the ground in front of the thatched-roof building. The bride is wearing a white dress and the groom is wearing a white shirt and dark trousers. They are surrounded by a large group of people, mostly women and children, who are sitting on the ground and looking towards the camera. The scene is set outdoors, with a thatched-roof building in the background.

This craft unmistakably reflects its Polynesian origin, for the silhouette of Kapinamarangi, both are unlike any other boat types found in Micronesia.

Some of these dragon boats are paddling canoes; others are propelled with outriggers. The outriggers are used to stabilize the boat when it is in the water. The outriggers are also used to stabilize the boat when it is on land.

The outriggers are used to stabilize the boat when it is in the water. The outriggers are also used to stabilize the boat when it is on land. The outriggers are used to stabilize the boat when it is in the water. The outriggers are also used to stabilize the boat when it is on land.

more of a sport than a hard work of garnering fish.

On the afternoon that we sailed, it was as if all the canoes of the island were out on the water. Many of the canoes were carrying a large number of people, and the water was filled with the sound of paddles and the sight of white sails.

Some of the people were carrying large fish, and some were carrying small fish. The people were all smiling and looking towards the camera.

Large fish were being carried on the water, and small fish were being carried on the water. The people were all smiling and looking towards the camera.



Jump on His Arm, a New Ring over His Shoulder. This Smiling Okinawan Symbolizes the New Hope That Has Come to the 'Horsestep to Japan'

It is a bright, sunny day in the heart of the island of Okinawa, and a young man, smiling broadly, stands next to a horse. He is holding a new ring over his shoulder, a symbol of the new hope that has come to the 'Horsestep to Japan'.

A bright, sunny day in the heart of the island of Okinawa, and a young man, smiling broadly, stands next to a horse. He is holding a new ring over his shoulder, a symbol of the new hope that has come to the 'Horsestep to Japan'.

It is a bright, sunny day in the heart of the island of Okinawa, and a young man, smiling broadly, stands next to a horse. He is holding a new ring over his shoulder, a symbol of the new hope that has come to the 'Horsestep to Japan'.

It is a bright, sunny day in the heart of the island of Okinawa, and a young man, smiling broadly, stands next to a horse. He is holding a new ring over his shoulder, a symbol of the new hope that has come to the 'Horsestep to Japan'.



* **Johnson's Expensive But Not Finishing Touches on War Rooms**

As a consequence of the above, we have the following theorem.

With Family Aboard, a Doubtless Pilot
His Last Seaward for the Landing

The authors are grateful to the referees for their valuable comments and suggestions.





On the St. Lawrence, West of Montreal, Quebec, Canada. The Forest was burned by a volcanic eruption.

Mount St. Helens, Washington, U.S.A. The forest was burned by a volcanic eruption.

Public Health Policy of the United States: The National Highway Traffic Safety





Chief of Staff and Lawton Collins Addressing the Army at the Eastern Hotel, Washington, D.C., 1918



Around N. E. A. S. Pierwater Harbor, Japs, and Hollanders are loaded, Awaiting Shipment to Sydney Harbor.

At the pier side, at the end of the pier, there is a large building, which is the main building of the pier.



Industrious Chairman Builds New Lane in Highways of the Cold

James H. Jones, the
chairman of the
United States
Steel Corp., is
one of the
most successful
businessmen in
the world. He
has a long list
of successes and
of the products of
his firm, which
are sold in every
part of the world.

He is a member of
the American
Steel Institute, the
National
Association of
Manufacturers,
the American
Iron and Steel
Institute, the
American
Society of
Mechanical
Engineers, the
American
Institute of
Mining and
Metallurgical
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Civil Engineers,



When Exploring Bay Chikmaw, Frigate Winds Blow, Fresh Quarters Like Alabaster, Scatter Gales Across Poles
The wind is a constant companion, blowing from the north, and the snow is a constant companion, covering the ground.

[illegible]

Less Kids In World
than, Shuri Sault Ferry
Child for "Chama, Chama
and "Cocobut"

There is a lot of
more to it than
just a few kids in
the world. It is a
big world, and it is
full of people who
are not like you or
me. There are people
who are different from
us in many ways.
Some are different in
color, some are different
in language, and some
are different in the way
they think. But all of
them are part of the
world, and we all have
to live together.

—





* Elaborate Letters Written to Chinese and Concern for the Hereafter

[illegible]

* Only 11,000 Chinese can read, so
 circulation of *Peoples Daily* is limited

[15] J. G. Thompson, "A note on the structure of the automorphism group of a free group," *Proc. Amer. Math. Soc.*, vol. 1, pp. 167-169, 1949.

*My friend
and here is
hoping for
a Hamilton*

There is a growing realization
that the only way to solve
the problem of the future is
to develop a practical system
of timekeeping. The only way
to do this is to have a watch
which is accurate, reliable, and
easy to use. The only way to
do this is to have a watch
which is accurate, reliable, and
easy to use. The only way to
do this is to have a watch
which is accurate, reliable, and
easy to use.

SHOWN ABOVE: 1. A 100% waterproof, shockproof, and fireproof Hamilton watch. 2. A 100% waterproof, shockproof, and fireproof Hamilton watch. 3. A 100% waterproof, shockproof, and fireproof Hamilton watch. 4. A 100% waterproof, shockproof, and fireproof Hamilton watch. 5. A 100% waterproof, shockproof, and fireproof Hamilton watch. 6. A 100% waterproof, shockproof, and fireproof Hamilton watch. 7. A 100% waterproof, shockproof, and fireproof Hamilton watch. 8. A 100% waterproof, shockproof, and fireproof Hamilton watch. 9. A 100% waterproof, shockproof, and fireproof Hamilton watch. 10. A 100% waterproof, shockproof, and fireproof Hamilton watch.



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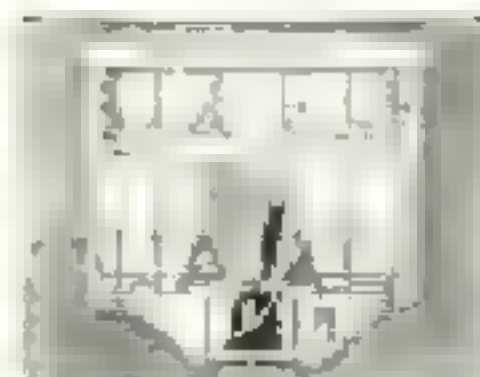
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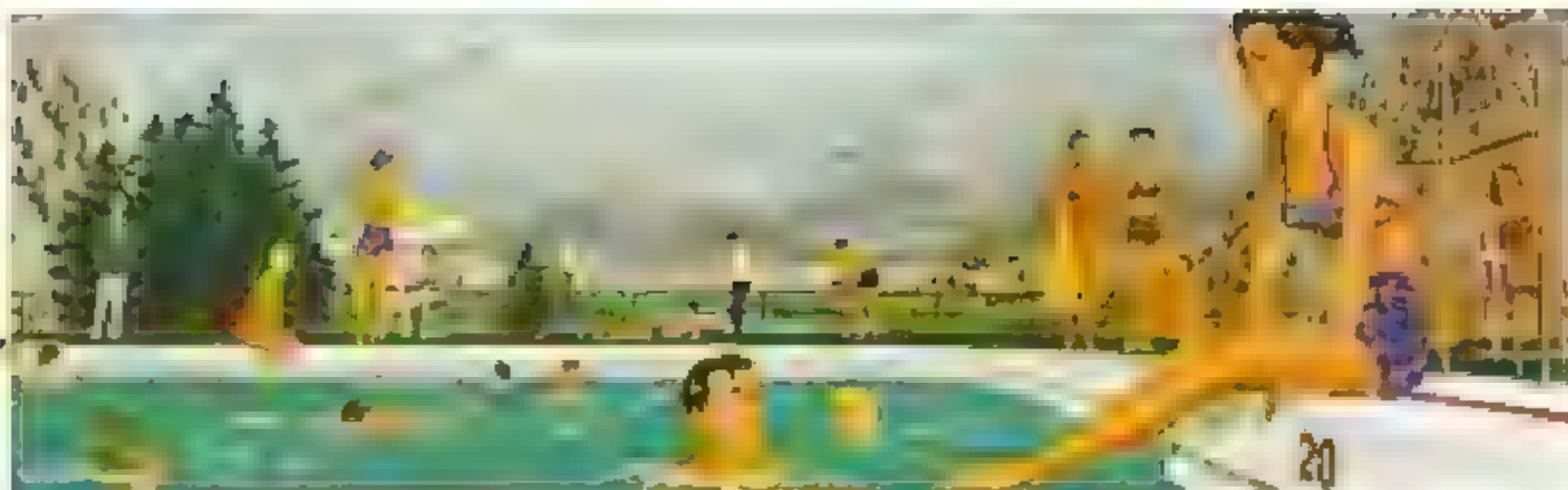
your nearest telephone directory. Or write to General Electric Company, Appliances and Major Appliances Department, Bridgeport, Conn.

Also see the new G-E Portable Dishwasher



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GENERAL  **ELECTRIC**

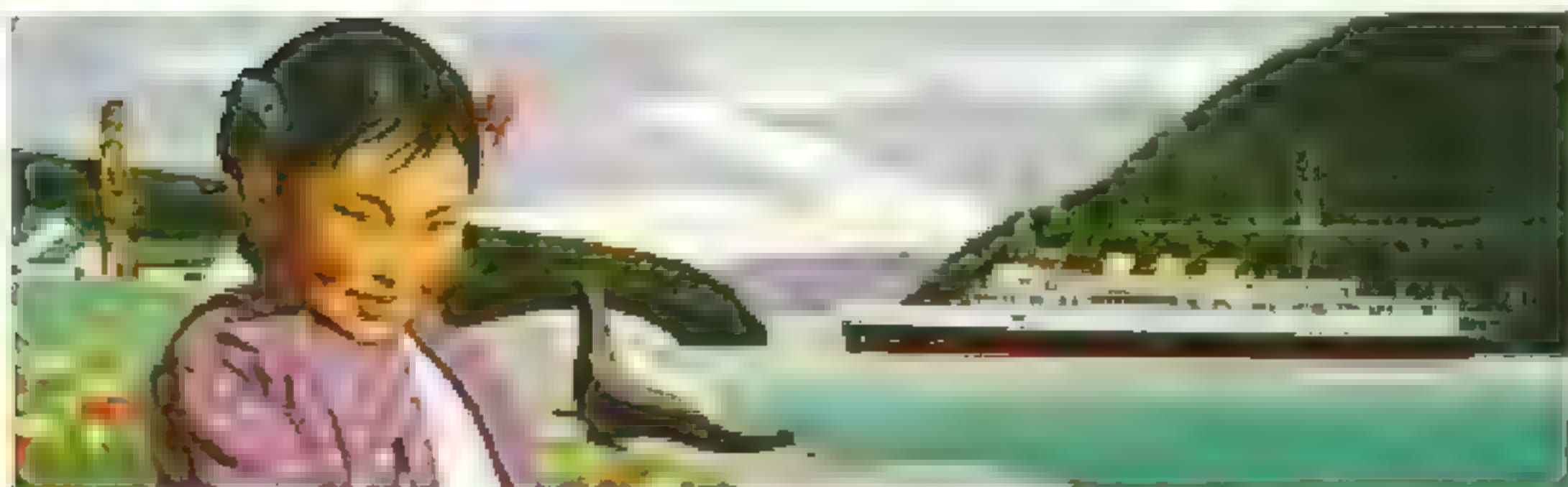


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WALLACE STERLING Silver

Beauty in Front

Beauty on Right

Beauty on Left



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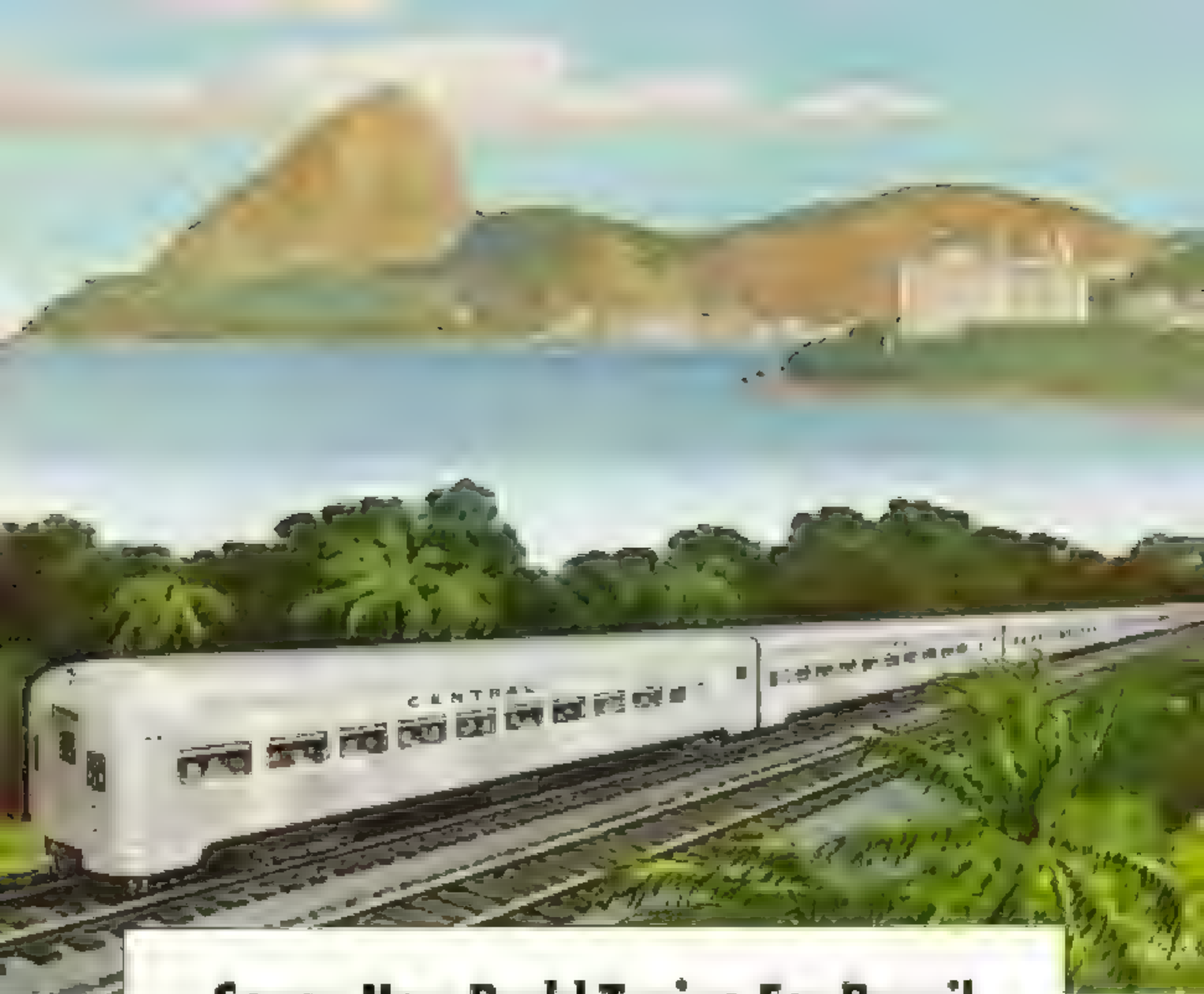
to feel a room comfortable and cool. To feel that the air is just what you need. To enjoy what the Carrier Low Voltage Room Air Conditioner does for you. It makes any room comfortable and cool. It removes dust, dirt, and odors. It keeps the air clean and fresh. It's a wonderful feeling. You know it when you feel it.

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AIR CONDITIONING



REFRIGERATION



Seven New Budd Trains For Brazil

On a midsummer day last January, the S. S. Christo Smith arrived in the harbor at Rio de Janeiro with the final shipment of sixty-three all-classes steel passenger cars built by The Budd Company, in Philadelphia, for the Central Railroad of Brazil.

They have been assembled into several car trains to provide the capital with daylight and overnight feeder service to all-feeder São Paulo, and to Belo Horizonte, mining center of diamonds, emeralds and the famous Brazilian law of 5000 miles.

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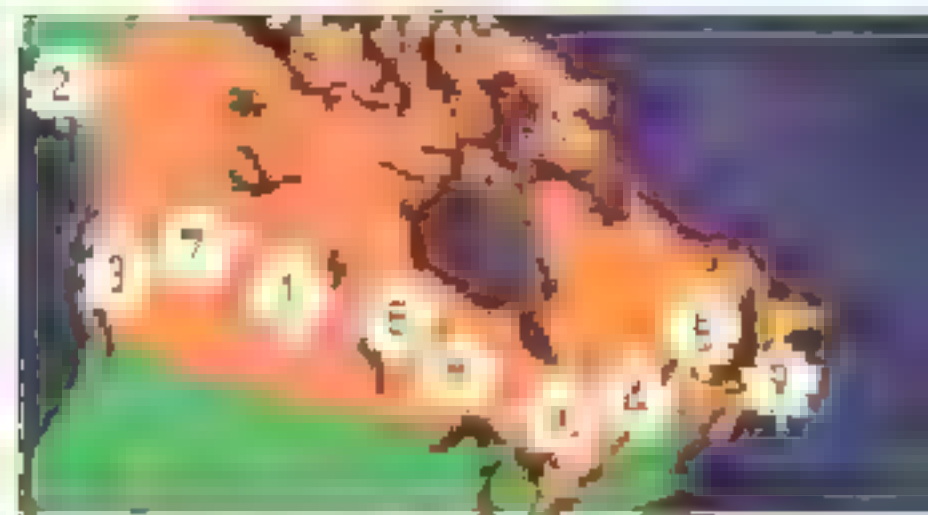
The Budd Co., Phila., Detroit

B U D D



REST AND PIAT have been used on the capital
 building of Pinar del Rio and have been used on
 the new building of the Pinar del Rio
 place of birth. Located between the city
 of Pinar del Rio and the city of Pinar
 del Rio, the city of Pinar del Rio is a
 very beautiful city. See Pinar del Rio, Pinar del Rio, Pinar del Rio.

**"TAKE A TECHNICOLOR VACATION IN
CANADA'S PROVINCES BY THE SEA"**



CHOOSE the 11 authors in the order in which they wrote the books.

1. American Visions
2. American Characters
3. Portrait of a Genius and Portrait of a Doctor
4. Eastern Sevens & Eastern Eights
5. Empire & Republic
6. Empire State & World Power
7. Empire in the Making
8. Land of the Living (Mystery)
9. The Gates of the Sea
10. Empire and the World
11. The American Novel

***ONE OF CANADA'S 10 TOP VACATIONS**

She stopped when they hit New York and went right off to a beach house where she and her sister stayed in New Yorkville. The house itself, after more than a week, was empty, and she

Marques and his 1987 *Journal* would be consistent with travel agency and tour business. New York edition has dated 1987-1988. *Journal* No. 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 91

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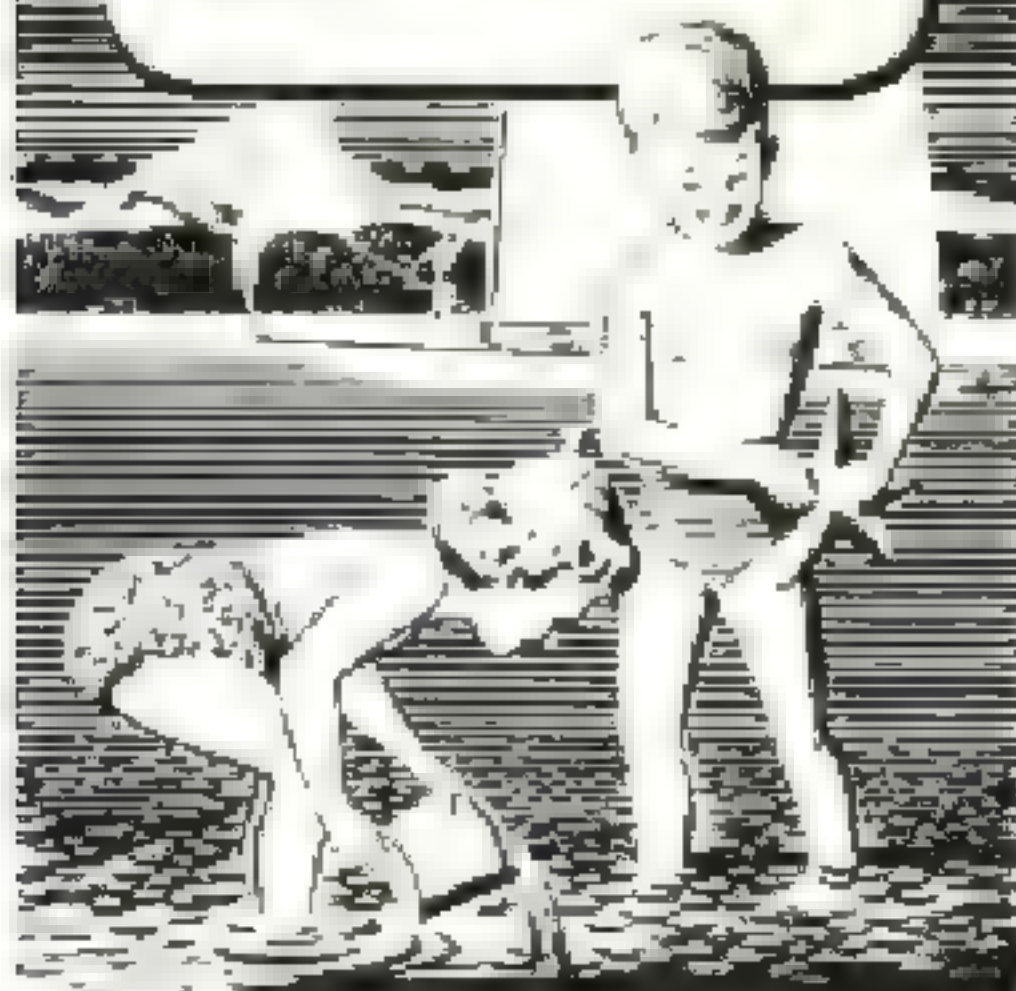
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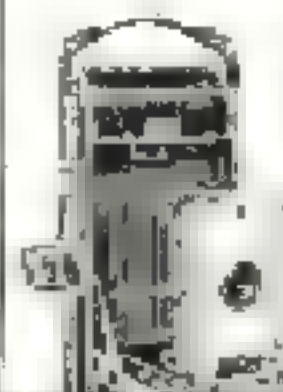


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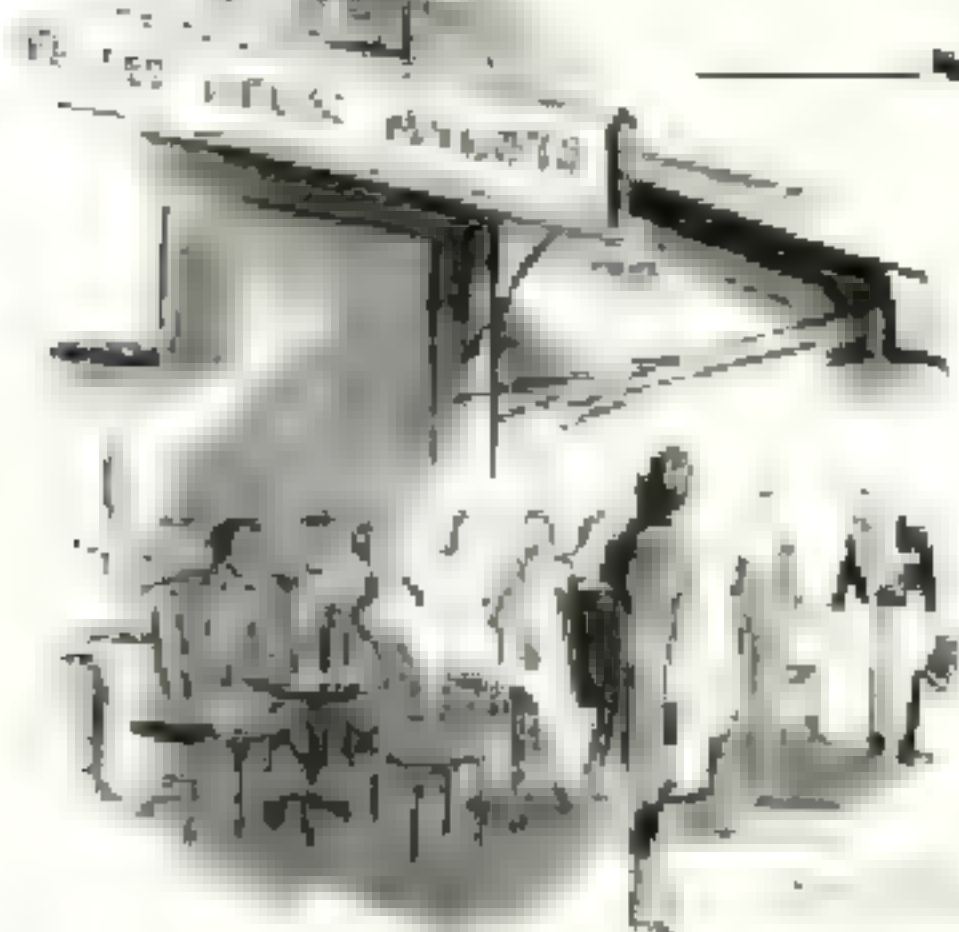
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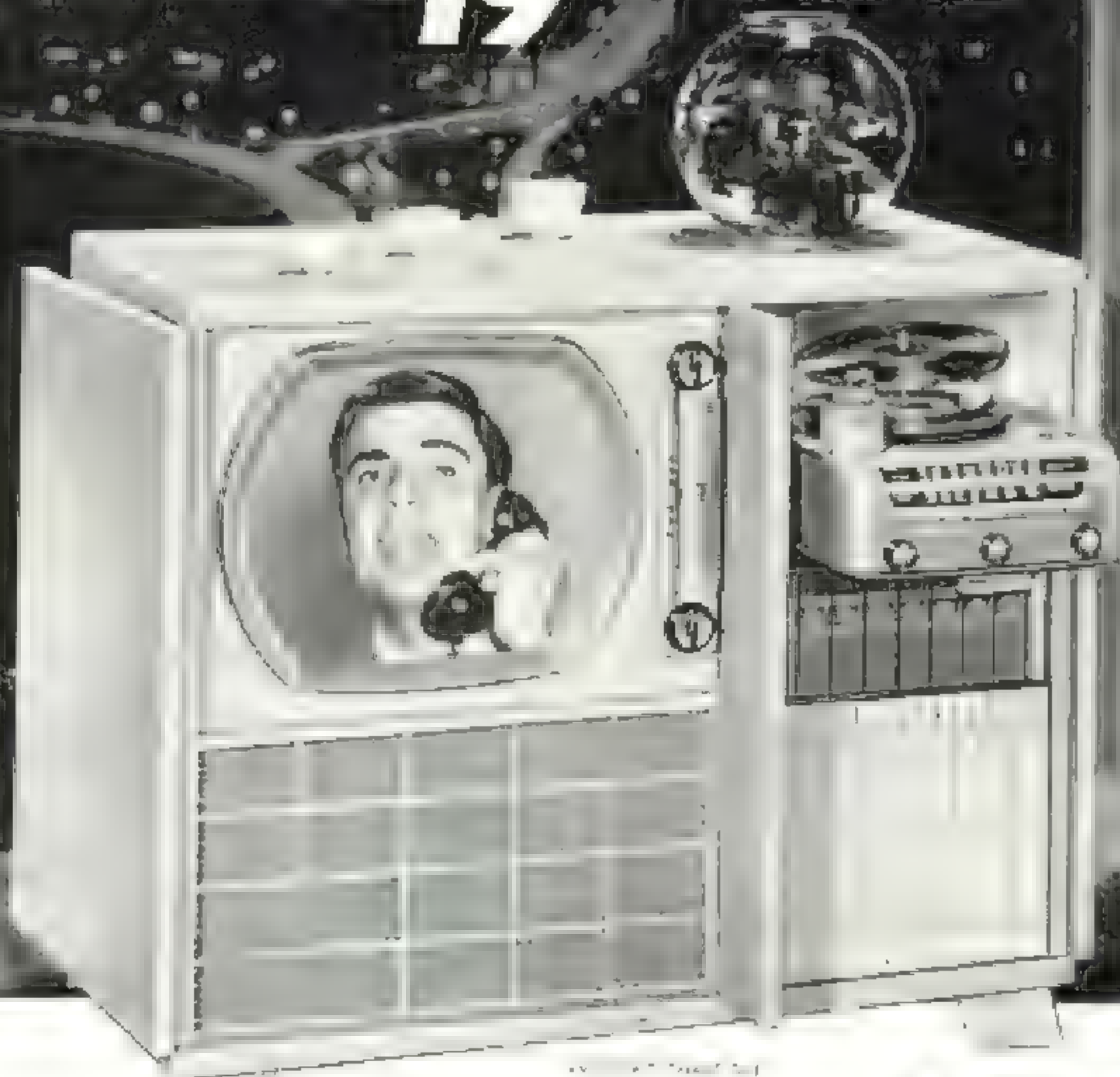
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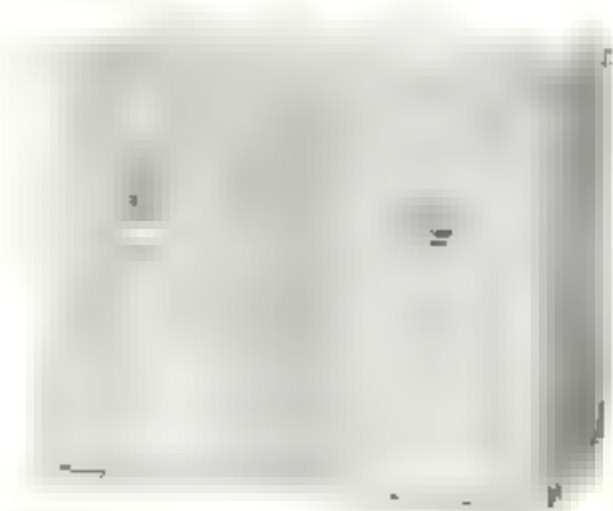


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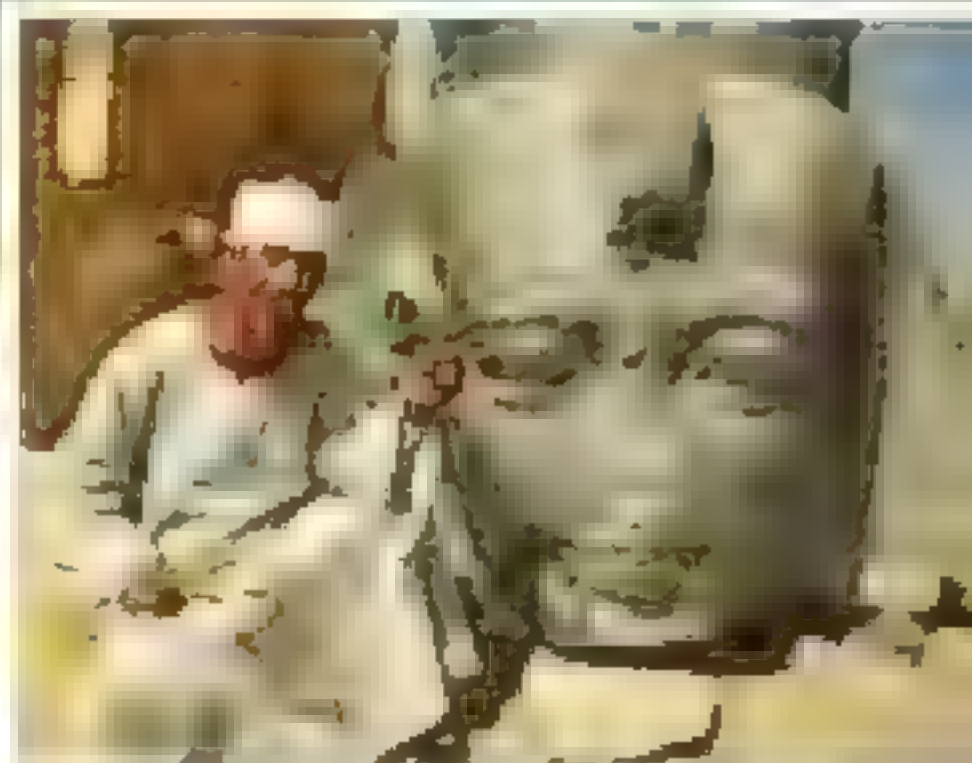
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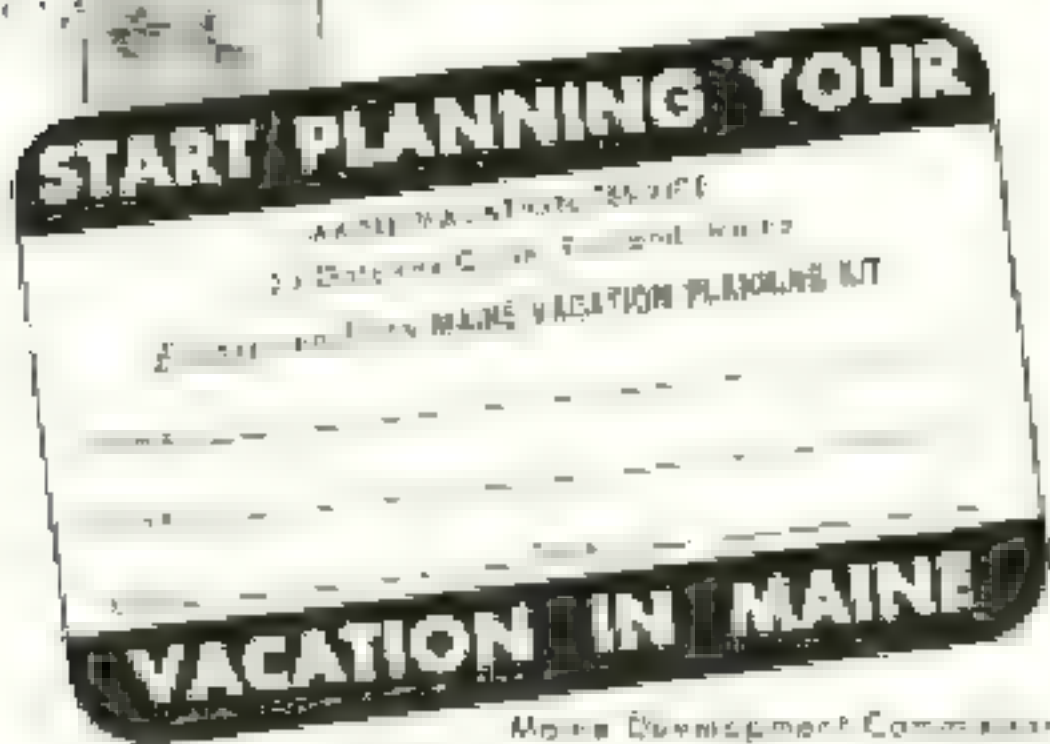
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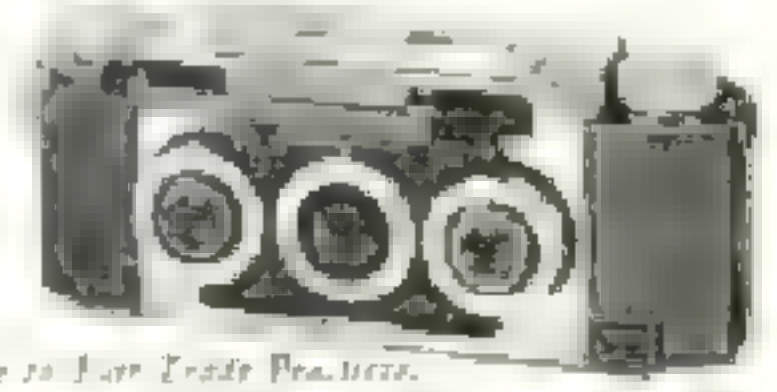
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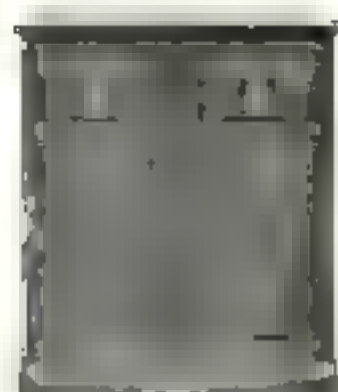
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1. What is the purpose of the study?
 2. What are the research questions?
 3. What are the hypotheses?
 4. What are the variables?
 5. What are the methods?
 6. What are the results?
 7. What are the conclusions?
 8. What are the implications?
 9. What are the limitations?
 10. What are the future directions?



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7 KACAF ON PRINTERIES — ALL POINTING TO CANADA IN 1980

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.
2. Next, it is important to gather relevant information and data. This can be done through research, consultation with experts, or by analyzing existing data sets.
3. Once the information is gathered, the next step is to develop a plan or strategy to address the problem. This may involve breaking the problem down into smaller, more manageable parts.
4. The fourth step is to implement the plan. This involves putting the strategy into action and monitoring progress as you go.
5. Finally, it is important to evaluate the results and make adjustments as needed. This can be done by comparing the actual results to the expected outcomes and identifying any areas for improvement.



1. *Order of the day*

[illegible]

《说文解字》：「𠂔，古文𠂔，从𠂔，从𠂔，𠂔，古文𠂔。」

11

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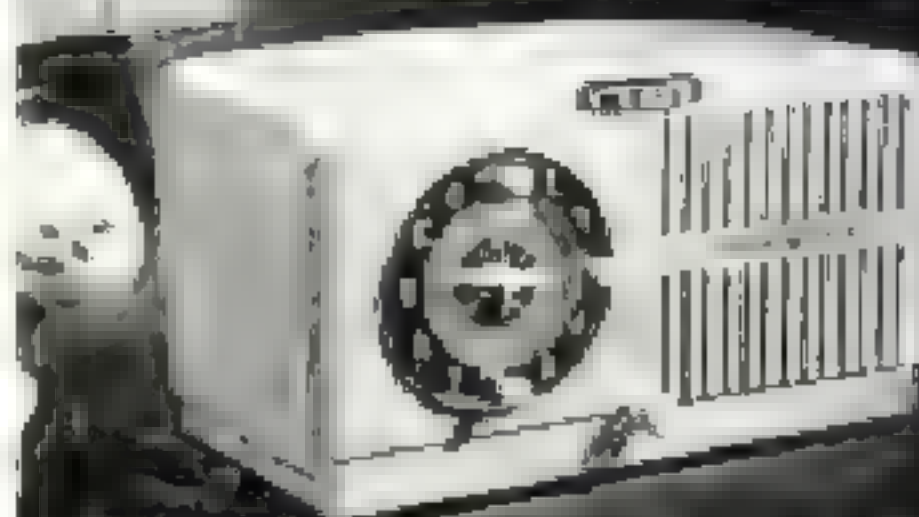
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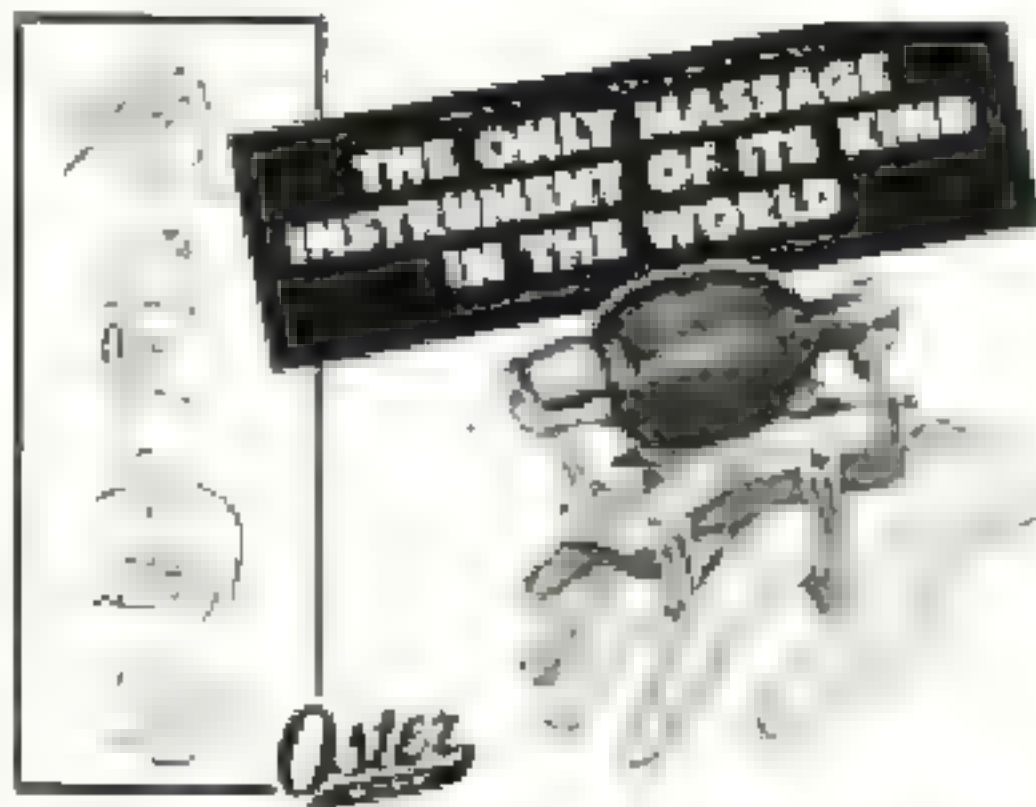
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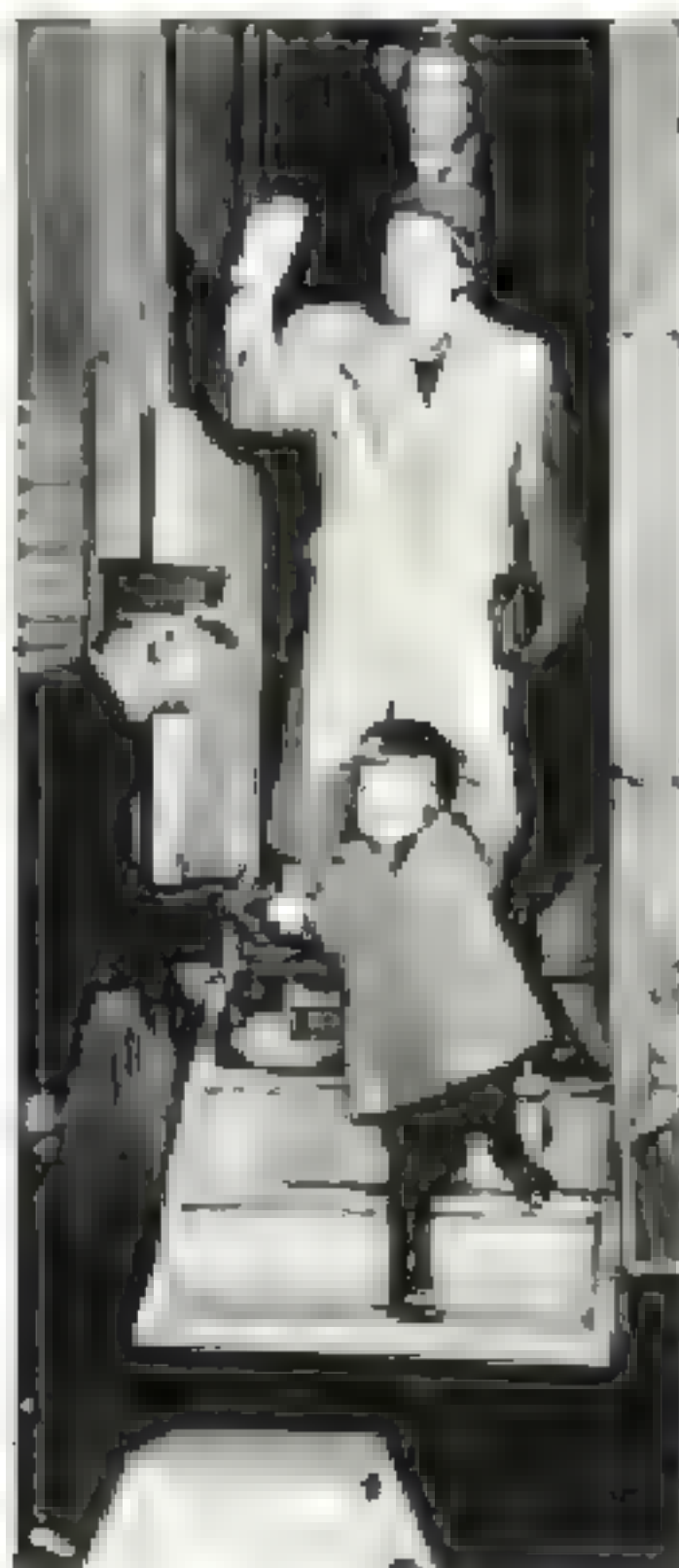
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Yoon et al. (1999) conclude that the common pattern across the four countries is that the demand for long-term care services is higher for those with lower income and lower education. Furthermore, the demand for long-term care services is higher for those with lower income and lower education in all four countries. The demand for long-term care services is higher for those with lower income and lower education in all four countries.



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1. *Journal of the American Medical Association*, 1997; 278: 1019-1024.



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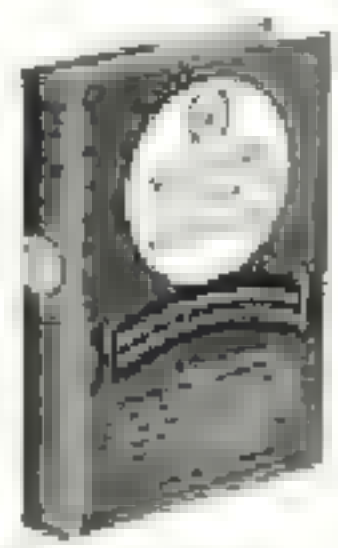
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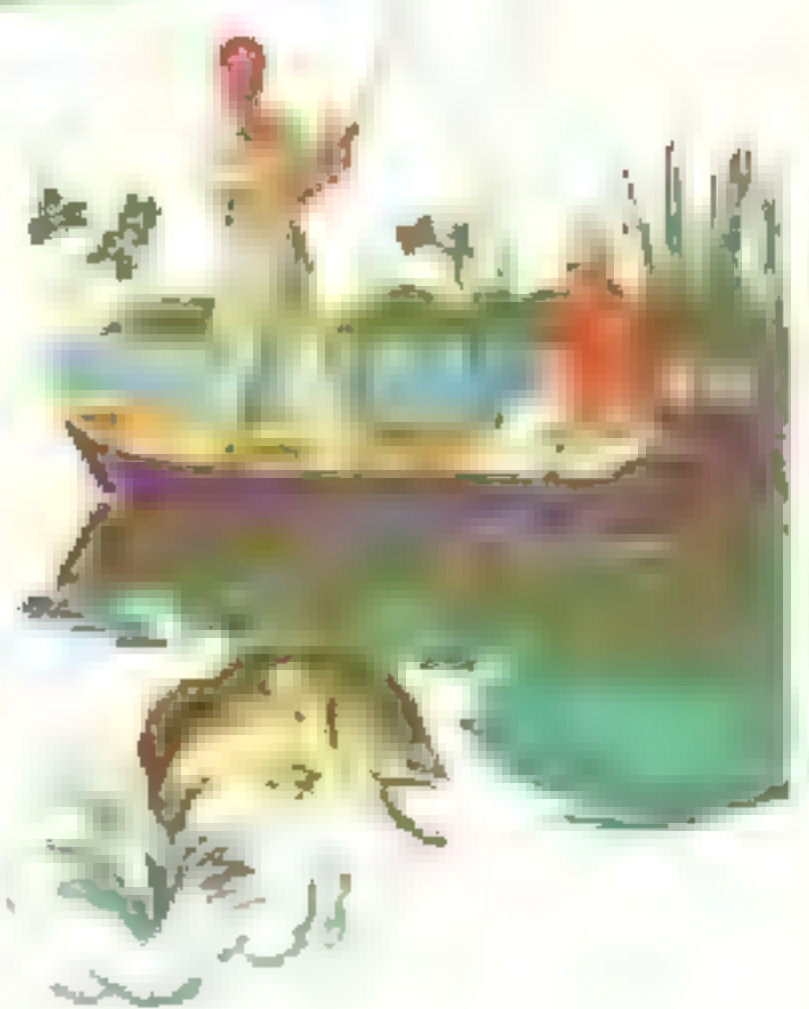


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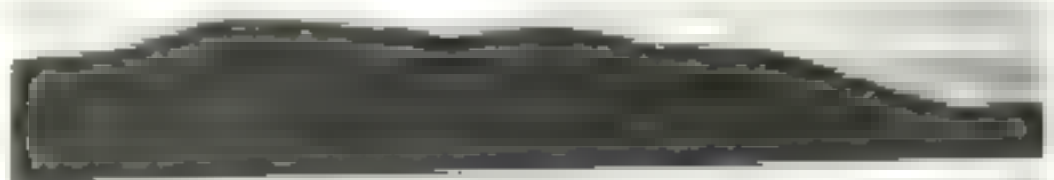


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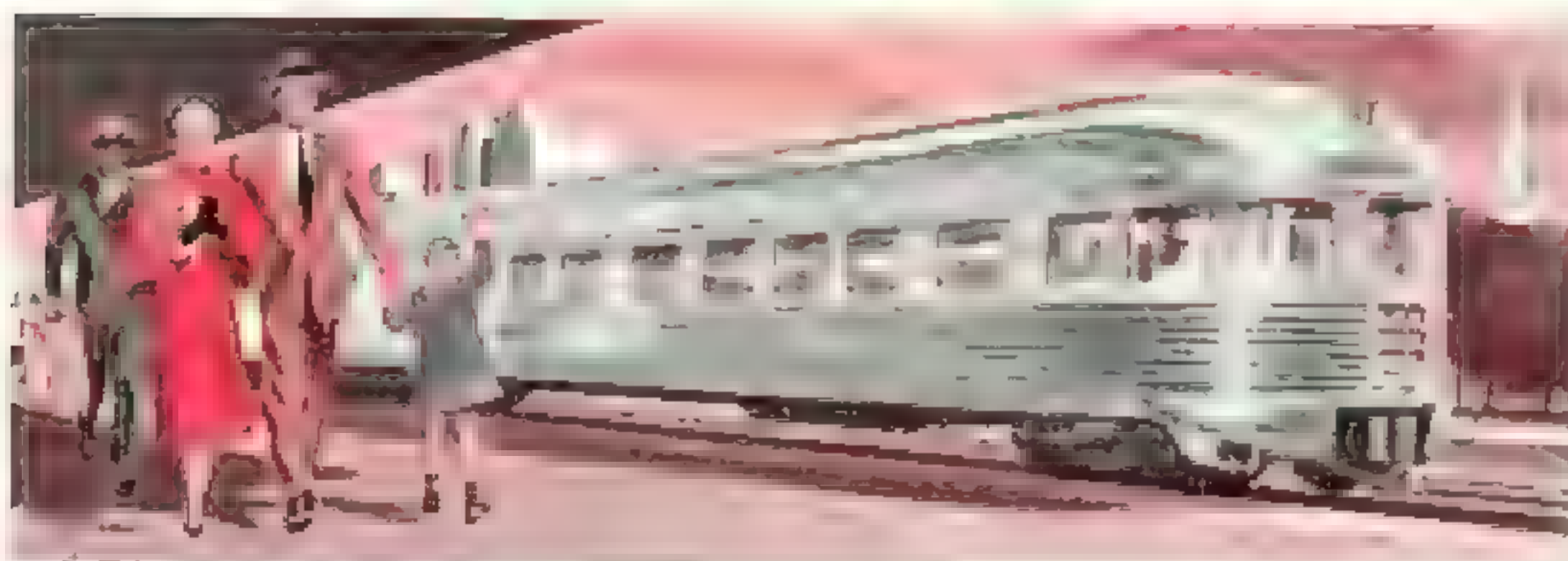
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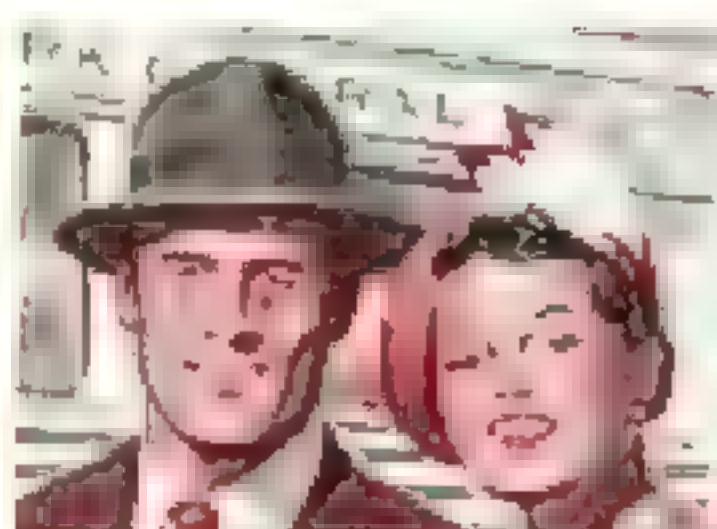
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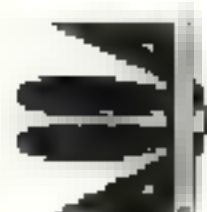


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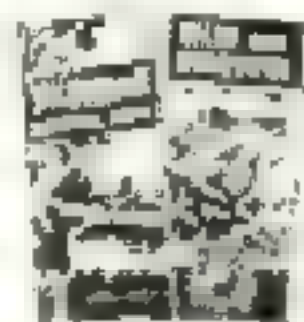


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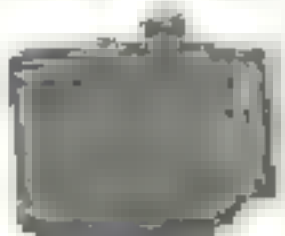
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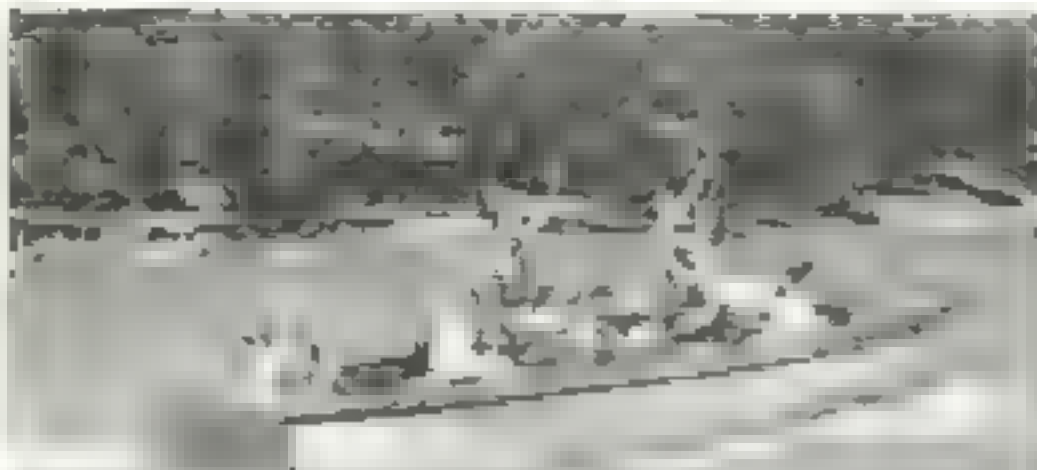
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As the research attack on cancer progresses, discoveries are constantly being made that offer hope of further gains against this disease.

Today, if diagnosed early and treated promptly and correctly, authorities say that seventy-five per cent of cancers of the breast, eighty per cent of cancers of the mouth, and over ninety-five per cent of cancers of the skin are curable. Cancer of other parts of the body also is being treated with greater success.

Progress in new treatments

Doctors and other scientists are steadily working on the major aspects of cancer. At present, efforts are being made to perfect a simple, quick test to detect the disease early. One such test was recently announced. It is based upon the discovery that the blood serum of persons with cancer has different properties than that of normal persons.

Studies are continuing on the use of radioactive isotopes and drugs to combat cancer. Improvements in surgical techniques are also encouraging.

Your part in fighting cancer

In view of the progress being made by medical science, annual physical examinations are more important than ever in safeguarding against cancer, especially for those over thirty-five years of age.

Authorities urge everyone to learn the "danger signals" of cancer that are listed at the right.

Fortunately, in the majority of cases, they turn out to be symptoms of conditions other than cancer.

There are still no "quick cures" for cancer. The only proved weapons which medical science now has against this disease are X-rays, radium, and surgery.

As medicine's knowledge of cancer increases, there is hope that the time may not be too far off when the disease will yield its secrets and thus cease to be a major threat to life. Meanwhile, with today's weapons—promptly and properly used—authorities predict that an ever increasing number of cancer victims may be saved.

The 7 "danger signals" that you should know

1. Any lump or thickening, especially in the breast, hip, or tongue.
2. Any irregular or unexplained bleeding.
3. A sore that does not heal, particularly about the mouth, tongue, or lips.
4. Noticeable changes in the color or size of a wart or mole.
5. Loss of appetite or continued indigestion.
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Dr. Mann found cow barns hanging on a bush

DR. WILLIAM MANN first observed the curious family life of the cow barn, *Pseudococcus*, when he explored the karakoram mountains in 1917.

Small silk and-leaf structures that the explorer found on bushes near his tent were the tip-off that the Pseudococcus was living in the mountains. One of these structures sheltered leaf hoppers, which exuded a kind of nectar that the ants collected. The ants were sheltering the hoppers, which in turn furnished milk cows, to furnish food for the ants.

But it was not until he located the ant trail that he followed the trails leading from it that Dr. Mann discovered how the aerial cow barns for the producing leaf hoppers were built.

Worker ants were carrying Pseudococcus eggs, hatched larvae to the building site. Then, the workers set to work spinning the silk to make shelters for the family's milk cows.

It seemed to Dr. Mann that the ant-leaf hoppers were as true as barn, with built-in milk cows. Some of the eggs, which he collected, had a trail quite true all the way to the house. You certainly might find a long Indian trail to

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$\mu_{\text{eff}} = \frac{\mu_0}{1 + \chi}$, where χ is the magnetic susceptibility of the medium.

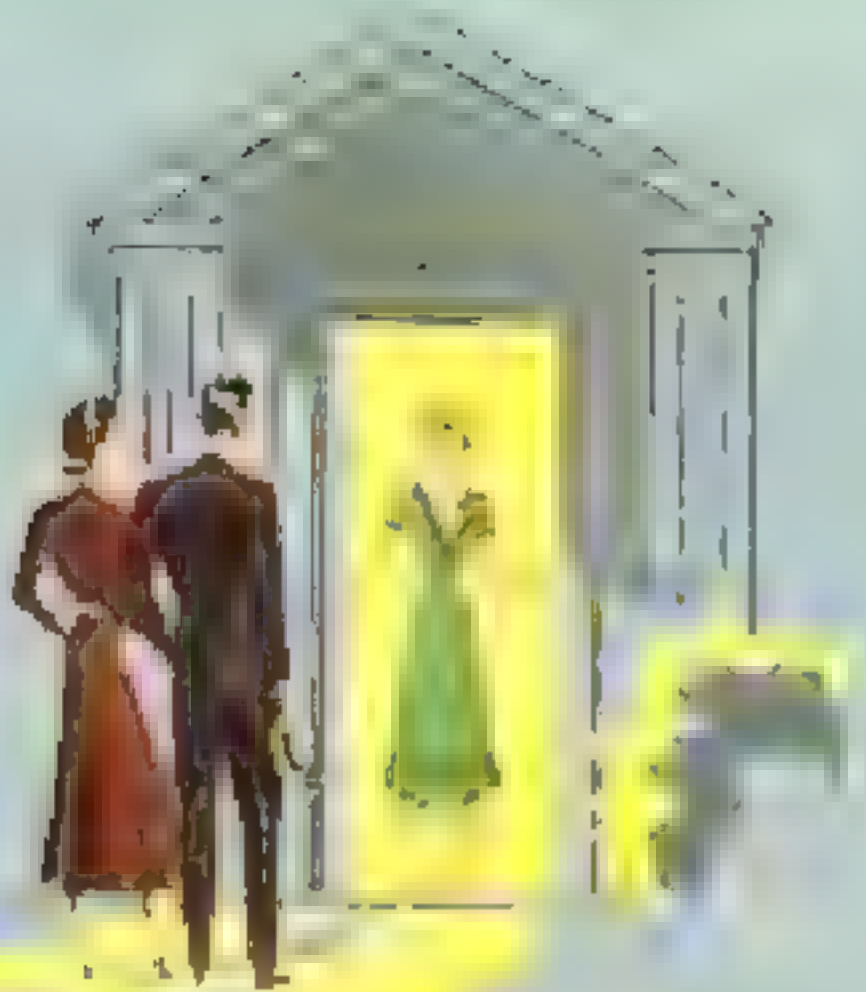


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Figure 10 shows the results of the regression analysis. The model explains 78% of the variance in the dependent variable. The independent variables are significant at the 0.05 level.



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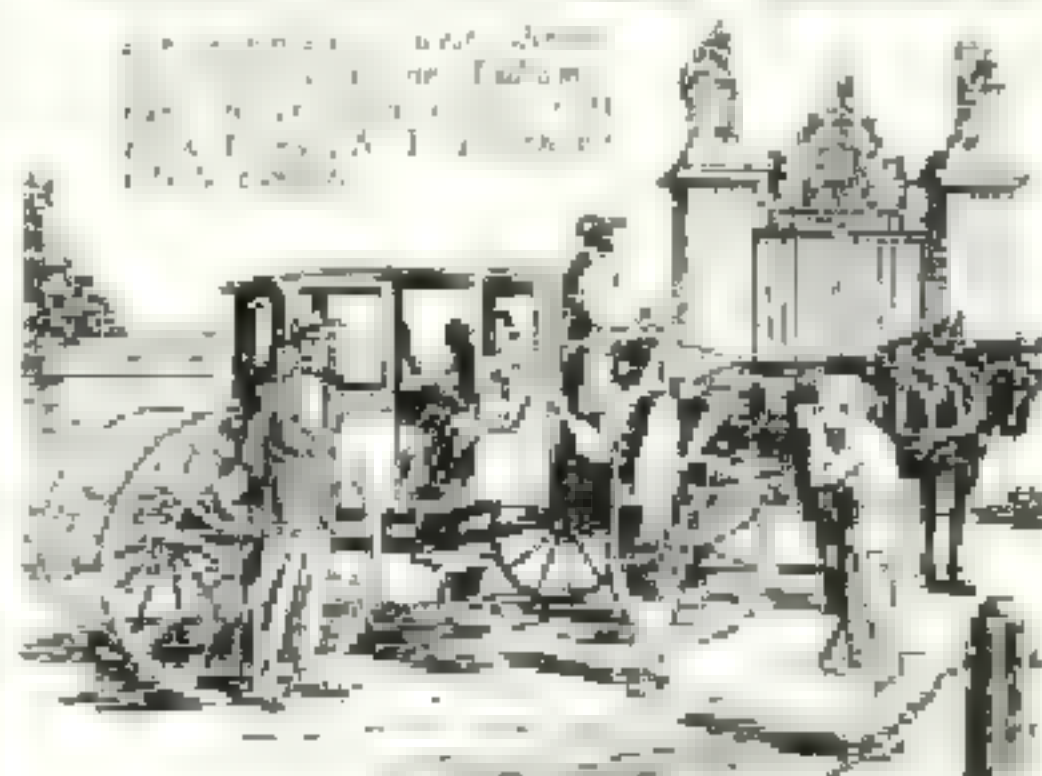
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3105, 3106, 3107, 3108, 3109, 3110, 3111, 3112, 3113, 3114, 3115, 3116, 3117, 3118, 3119, 3120, 3121, 3122, 3123, 3124, 3125, 3126, 3127, 3128, 3129, 3130, 3131, 3132, 3133, 3134, 3135, 3136, 3137, 3138, 3139, 3140, 3141, 3142, 3143, 3144, 3145, 3146, 3147, 3148, 3149, 3150, 3151, 3152, 3153, 3154, 3155, 3156, 3157, 3158, 3159, 3160, 3161, 3162, 3163, 3164, 3165, 3166, 3167, 3168, 3169, 3170, 3171, 3172, 3173, 3174, 3175, 3176, 3177, 3178, 3179, 3180, 3181, 3182, 3183, 3184, 3185, 3186, 3187, 3188, 3189, 3190, 3191, 3192, 3193, 3194, 3195, 3196, 3197, 3198, 3199, 3200, 3201, 3202, 3203, 3204, 3205, 3206, 3207, 3208, 3209, 3210, 3211, 3212, 3213, 3214, 3215, 3216, 3217, 3218, 3219, 3220, 3221, 3222, 3223, 3224, 3225, 3226, 3227, 3228, 3229, 3230, 3231, 3232, 3233, 3234, 3235, 3236, 3237, 3238, 3239, 3240, 3241, 3242, 3243, 3244, 3245, 3246, 3247, 3248, 3249, 3250, 3251, 3252, 3253, 3254, 3255, 3256, 3257, 3258, 3259, 3260, 3261, 3262, 3263, 3264, 3265, 3266, 3267, 3268, 3269, 3270, 3271, 3272, 3273, 3274, 3275, 3276, 3277, 3278, 3279, 3280, 3281, 3282, 3283, 3284, 3285, 3286, 3287, 3288, 3289, 3290, 3291, 3292, 3293, 3294, 3295, 3296, 3297, 3298, 3299, 3300, 3301, 3302, 3303, 3304, 3305, 3306, 3307, 3308, 3309, 3310, 3311, 3312, 3313, 3314, 3315, 3316, 3317, 3318, 3319, 3320, 3321, 3322, 3323, 3324, 3325, 3326, 3327, 3328, 3329, 3330, 3331, 3332, 3333, 3334, 3335, 3336, 3337, 3338, 3339, 3340, 3341, 3342, 3343, 3344, 3345, 3346, 3347, 3348, 3349, 3350, 3351, 3352, 3353, 3354, 3355, 3356, 3357, 3358, 3359, 3360, 3361, 3362, 3363, 3364, 3365, 3366, 3367, 3368, 3369, 3370, 3371, 3372, 3373, 3374, 3375, 3376, 3377, 3378, 3379, 3380, 3381, 3382, 3383, 3384, 3385, 3386, 3387, 3388, 3389, 3390, 3391, 3392, 3393, 3394, 3395, 3396, 3397, 3398, 3399, 3400, 3401, 3402, 3403, 3404, 3405, 3406, 3407, 3408, 3409, 3410, 3411, 3412, 3413, 3414, 3415, 3416, 3417, 3418, 3419, 3420, 3421, 3422, 3423, 3424, 3425, 3426, 3427, 3428, 3429, 3430, 3431, 3432, 3433, 3434, 3435, 3436, 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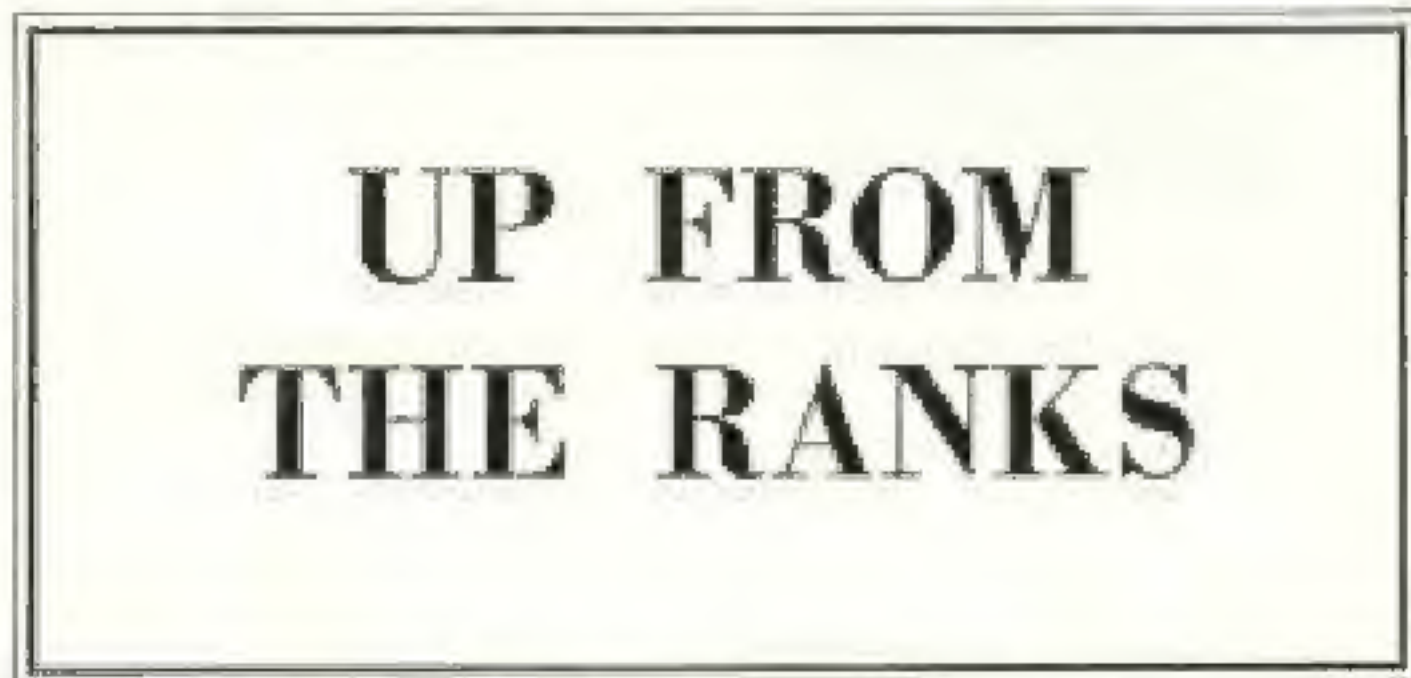
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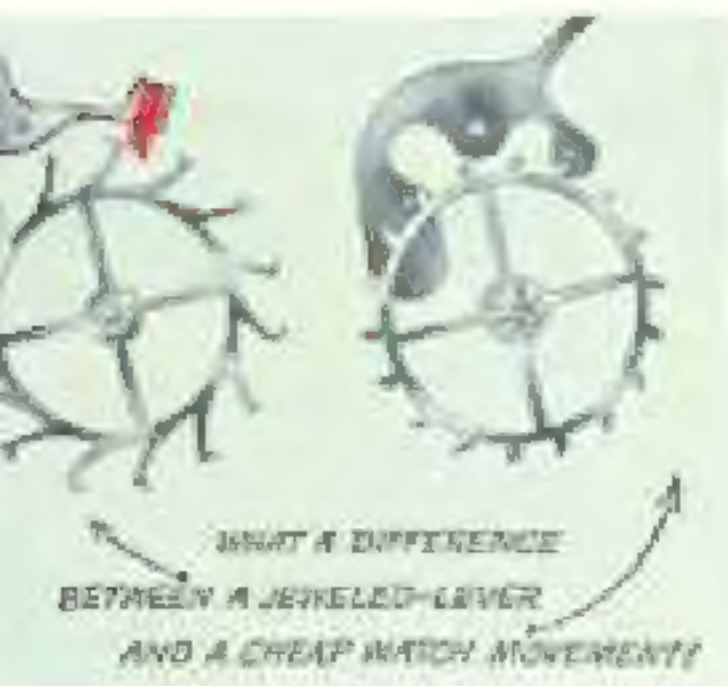
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